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THIRD SESSION, FORTY-SECOND CONGRESS.

EXECUTIVE DOCUMENTS

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1872-'73.

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- Volume 1....No. 1, part 1, Foreign Relations, parts 1, 2, 3, 4, 5, and 6.
Volume 2....No. 1, part 2, War, parts 1 and 2.
Volume 3....No. 1, part 5, Interior, parts 1 and 2.
Volume 4....No. 1, parts 3, 4, 6, and 7, and No. 2.
Volume 5....No. 3 to No. 19, inclusive, except No. 5.
Volume 6....No. 5 and No. 190, with which is bound Mis. Doc. No. 44.
Volume 7....No. 20 to No. 91, inclusive.
Volume 8....No. 92 to No. 150, inclusive.
Volume 9....No. 151 to No. 210, inclusive, except Nos. 160 and 190.
Volume 10....No. 160, Commercial Relations.
Volume 11....No. 211 to No. 242, inclusive, except No. 240.
Volume 12....No. 240, Coast Survey.

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OF THE

HOUSE OF REPRESENTATIVES OF THE UNITED STATES

FOR THE

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COST OF TRANSPORTATION OF MAILS ON THE UNION
PACIFIC RAILROAD.

LETTER

FROM

THE POSTMASTER GENERAL,

RELATIVE TO

The amount paid the Union Pacific Railroad Company for transportation of mails in each fiscal year since June 30, 1866.

JANUARY 30, 1873.—Referred to the Select Committee of Investigation on the Credit Mobilier, appointed under the resolution of the House of January 6, 1873, and ordered to be printed.

POST-OFFICE DEPARTMENT,

Washington, D. C., January 29, 1873.

DEAR SIR: In answer to so much of the resolution adopted by the House of Representatives on 20th instant, on motion of Mr. Palmer, as directs me to report to the House “the amount paid the Union Pacific Railroad Company for transportation of the mails in each fiscal year since June 30, 1866, together with an estimate of what said transportation would have cost if said railroad had not been constructed,” I have the honor to state that the Auditor of the Treasury for the Post-Office Department reports to me the amounts paid the Union Pacific Railroad Company as follows, viz:

Fiscal year ended June 30, 1867, (May and June)	\$7, 289 83
Fiscal year ended June 30, 1868	82, 954 65
Fiscal year ended June 30, 1869	226, 109 25
Fiscal year ended June 30, 1870	272, 075 00
Fiscal year ended June 30, 1871	283, 855 00
Fiscal year ended June 30, 1872	283, 855 00
Total	1, 156, 138 73

To estimate what “said transportation would have cost if said railroad had not been constructed,” I take for comparison the cost of the service superseded by the transfer of the mails to the Union Pacific Railroad. The service superseded was the following, viz:

1st. Route 14401, from Council Bluffs, Iowa, to Kearney City, Nebraska, 198½ miles, and back, six times a week, under contract to Rufus Haywood, at \$20,043 per annum. The contract was to expire June 30,

1870; but, in consequence of the transfer of the mails to the Union Pacific Railroad, the service was superseded from and after May 31, 1867, the contractor being allowed one month's extra pay, in conformity with a stipulation in the contract. The three years' pay thus dispensed with would have amounted to \$60,129. Supposing that, if the railroad had not been constructed, the contract could have been renewed at the same rate, the two years' pay from July 1, 1870, to June 30, 1872, would have amounted to \$40,086, making, with the \$60,129 above mentioned, \$100,215.

2d. Route 14260, from Atchison, Kansas, to Salt Lake City, Utah, 1,220 miles, and back, daily, under contract to Ben Holladay for four years from the 1st October, 1864, to 30th September, 1868, at \$365,000 per annum. On the 31st July, 1866, an order was made permitting the contractor to change the route so as to have two points of departure, one from Junction City, Kansas, on the Union Pacific Railroad, eastern division, (now the Kansas Pacific,) running from Wyandotte, Kansas, and the other from Fort Kearney, Nebraska, on the Union Pacific Railroad, running from Omaha, Nebraska, the two lines meeting at Denver City, Colorado. This change was made without any diminution of the contractor's pay. The only deductions from his pay, on account of the extension of the Union Pacific Railroad, was one at the rate of \$17,352 per annum for a curtailment of fifty-eight miles' distance, between Cheyenne and Laramie City, from June 15, 1868, and another at the rate of \$36,200 per annum for a curtailment of one hundred and twenty-one miles' distance, between Laramie City and Benton, from August 10, 1868. On the amount of service dispensed with by these curtailments a month's extra pay was allowed, in conformity with the terms of the contract. The amount of the two deductions, less the month's extra pay, from their dates to the close of the contract term, 30th September, 1868, was \$5,753.28. Supposing, again, that if the railroad had not been constructed, the contract for service on this route could have been renewed on the same terms; the pay from 1st October, 1868, to 30th June, 1872, would have amounted to \$1,368,750, making, with the \$5,753.28 above mentioned, \$1,374,503.28.

3d. Route 1517, from New York, by Aspinwall and Panama, to San Francisco, 6110 miles, and back, three times per month, under contract to the Pacific Steamship Company, at \$150,000 per annum, to expire 30th June, 1870. One of the monthly trips was discontinued from and after 31st December, 1869, thus dispensing with pay to the amount of \$25,000 for the six months remaining of the contract-term to 30th June, 1870. Adding \$300,000 for two years, from the 1st July, 1870, to 30th June, 1872, on the supposition that this service would have been continued if the railroad had not been constructed, the cost on this route would have amounted to \$325,000.

Adding the supposed cost on the three routes, namely, on the first, above described, \$100,215; on the second, \$1,374,503.28; and on the third, \$325,000—\$1,799,718.28 may be set down as "an estimate of what said transportation would have cost if said railroad had not been constructed."

On the expiration of Holladay's contract for route 14260—the second above described—a contract was made with Wells, Fargo & Co. for carrying mails overland, between the termini of the Union Pacific Railroad and the Central Pacific Railroad, daily for the term of one year, from 1st October, 1868, or until the two railroads should meet, at the rate of seventeen hundred and fifty thousand dollars per annum, subject to deductions *pro rata* for every section of fifty miles of railroad

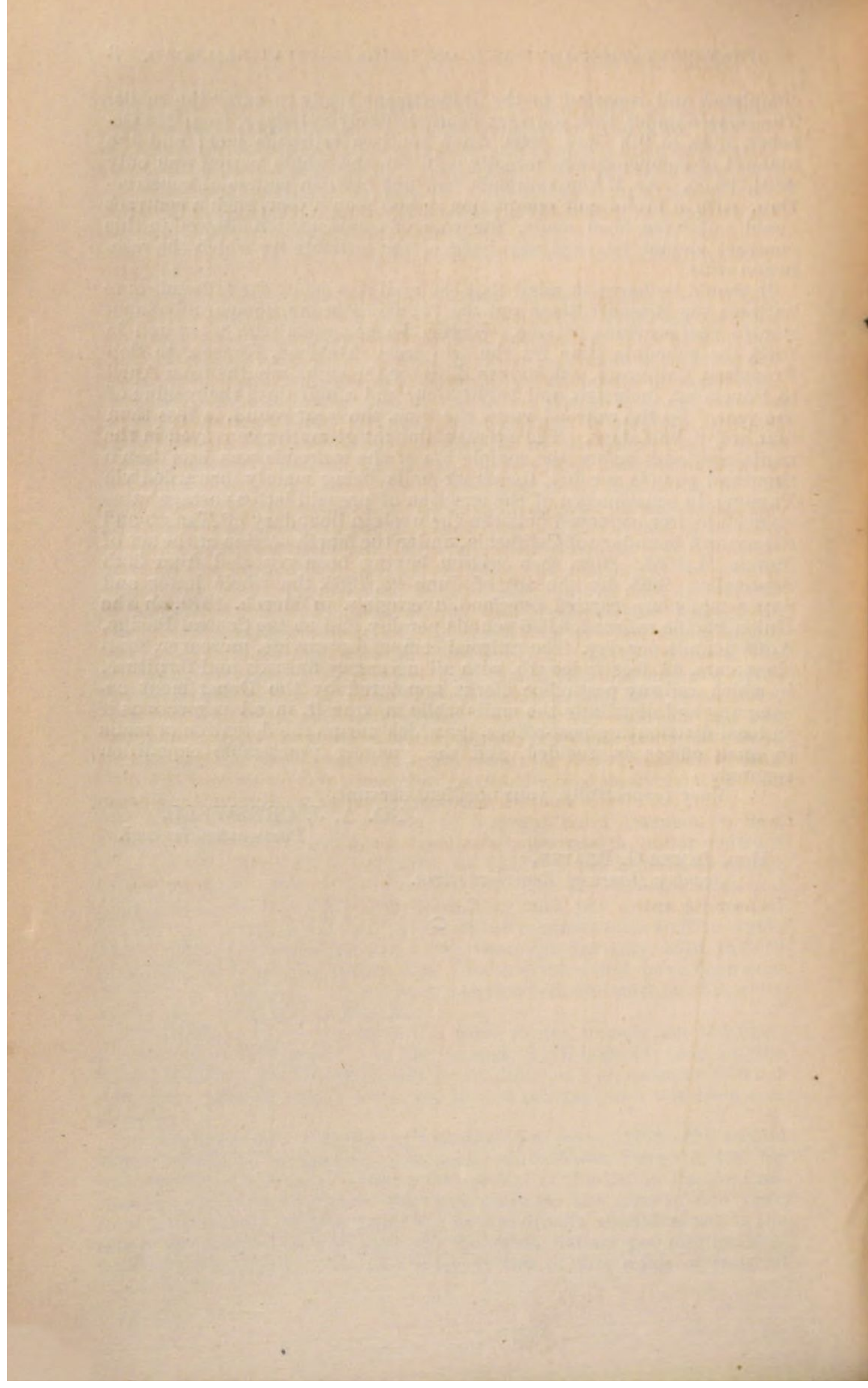
completed and reported to the Department ready to carry the mails. The service under this contract continued only 221 days, from 1st October, 1868, to 9th May, 1869, when the two railroads met; and the amount of compensation actually paid for the whole period was only \$494,296.55. As, if the railroads had not been in course of construction, with a promise of completion in less than a year, such a contract could not have been made, the rate of compensation allowed in this contract cannot be used as a basis of the estimate for which the resolution calls.

It should be borne in mind that the mail-service by the railroad route between the Missouri River and the Pacific coast is incomparably superior to the previous service. Under the contracts which expired in 1868, the schedule time for the trip from Atchison, Kansas, to San Francisco, California, was sixteen days for the eight months from April to November, inclusive, and twenty-four and a half days the residue of the year. By the railroad route the time, the year round, is less than four and a half days. The average amount of matter conveyed in the mails overland before the completion of the railroads was less than a thousand pounds per day, the paper-mails being mainly forwarded via Panama, in consequence of the exaction of prepaid letter-postage rates on such matter conveyed between the western boundary of Kansas and the eastern boundary of California, under the fourth section of the act of March 25, 1864. Now, that section having been repealed from 30th September, 1868, by the act of June 25, 1868, the whole letter and paper mails are carried overland, averaging, in March, 1870, on the Union Pacific railroad, 6,376 pounds per day, and on the Central Pacific, 5,308 pounds per day. The railroad companies provide, moreover, first-class cars, 48 feet in length, with all necessary fixtures and furniture, in which railway post-office clerks appointed by the Department accompany and distribute the mails while in transit, in all respects as if in local distributing post-offices, by which means the detention of mails in such offices is avoided, and the greatest practicable expedition secured.

Very respectfully, your obedient servant,

JNO. A. J. CRESWELL,
Postmaster-General.

HON. JAMES G. BLAINE,
Speaker House of Representatives.



CLERKS AND EMPLOYÉS IN THE DEPARTMENT OF THE
INTERIOR.

L E T T E R

FROM

THE SECRETARY OF THE INTERIOR,

RESPECTING

*Numbers, &c., of persons appointed in his Department for duty in Washing-
ton during the year 1872.*

JANUARY 30, 1873.—Referred to the Committee on Appropriations and ordered to be
printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., January 25, 1873.

SIR: In compliance with the terms of the House resolution adopted
January 18, 1873, I submit herewith a statement of the employés of
this Department, appointed during the year 1872, for duty at the city
of Washington, designating those who were appointed under the opera-
tions of the civil-service rules.

Very respectfully, your obedient servant,

C. DELANO,
Secretary.

The SPEAKER of the House of Representatives.

A statement of the employés of the Department of the Interior appointed during the year 1872, for duty in the city of Washington, &c., as requested in House resolution of January 18, 1873.

Name.	State.	Salary.	Office.	Appointed.	Remarks.
Weakly, H. C.	Ohio	\$1, 200	Pension	Jan. 1	Civil-service rules went into operation by Executive order of April 16, 1872.
Davis, Lewis	Dist. Columbia	720	Census	Jan. 1	
Dalrymple, Mrs. Mary	Ohio	900	Pension	Jan. 1	
Ragsdale, George H.	Iowa	1, 400	do	Jan. 1	
Abbott, H. S.	Pennsylvania	1, 200	Patent	Jan. 1	
Voorhees, P. R.	Maryland	1, 200	do	Jan. 1	
Wilson, J. F.	Illinois	1, 200	Pension	Jan. 1	
Comstock, J. M.	New York	1, 200	do	Jan. 1	
Cunningham, Miss F.	Dist. Columbia	900	do	Jan. 1	
Harris, W. L.	Vermont	1, 200	do	Jan. 1	
Murphy, John	Massachusetts	720	do	Jan. 1	
Carpenter, T. H.	Iowa	1, 200	Land	Jan. 1	
Fracker, T. L.	Ohio	1, 200	Pension	Jan. 1	
Kinsley, W. W.	Michigan	1, 200	do	Jan. 1	
Woods, C. J.	Indiana	1, 200	do	Jan. 1	
Frost, George W.	Ohio	1, 200	do	Jan. 1	
Fillmore, W. E.	Minnesota	1, 200	do	Jan. 23	
Rogers, J. W.	Pennsylvania	720	do	Jan. 26	
Sprague, F. H.	Illinois	1, 200	do	Feb. 15	
Ryan, J. B. J.	Nebraska	1, 200	do	Feb. 19	
Macauley, J. A.	West Virginia	1, 200	do	Mar. 1	
Catlin, Miss C. S.	Massachusetts	900	do	Mar. 1	
Burlingame, Miss K. F.	New York	900	do	Mar. 1	
Barker, Miss Mary	Iowa	900	Land	Mar. 1	
Gleason, Ira F.	New York	1, 200	Pension	Mar. 4	
Spurling, A. B.	Maine	1, 400	do	Mar. 8	
Clymer, D. B.	Pennsylvania	720	Secretary's	Mar. 18	
Hosmer, Granville	Nevada	1, 200	Land	Mar. 27	
Miller, Horatio S.	Ohio	1, 200	Pension	April 1	
Haupt, Lewis	Pennsylvania	1, 400	Patent	April 1	
Ford, Edward C.	Dist. Columbia	1, 200	do	April 1	
Pushaw, Charles	Maine	1, 200	Pension	April 6	
Bliss, E. B.	Dist. Columbia	1, 200	do	April 6	
Stiles, Eugene	New Hampshire	1, 200	do	April 12	
Nichols, John	South Carolina	720	do	April 16	Laborer; exempt.
McBride, Cornelius	Mississippi	720	do	April 16	Messenger; exempt.
Jackson, Mrs. Elizabeth	Dist. Columbia	300	do	April 21	Laborer; exempt.
Murphy, Miss N. R.	do	900	do	May 1	Stenographer; exempt.
Holly, Isaac	do	720	do	May 6	Watchman; exempt.
Tubman, George W.	do	720	do	May 6	Do.
Goldberg, Miss Ida	Alabama	900	do	May 8	Designated prior to the adoption of the rules.
Homer, Miss C. B.	Maine	900	do	May 15	
Squires, Joseph C.	Pennsylvania	1, 200	do	May 15	
Mack, Frederick	Vermont	1, 200	do	May 15	Appointed under the rules.
Dallas, Miss Ella	Dist. Columbia	900	Land	May 16	
Baxter, J. B. G.	Wisconsin	1, 400	Pension	May 22	
Cox, Luther C.	Maryland	1, 200	do	May 22	Designated prior to the adoption of the rules.
Wines, G. W.	Tennessee	1, 200	do	May 23	
Stumph, Walter	North Carolina	720	do	June 21	Messenger; exempt.
Warren, S. R.	Massachusetts	1, 800	Education	July 1	Statistician; exempt.
Alexander, H. H.	Dist. Columbia	1, 200	Land	July 8	Stenographer; exempt.
Hinds, Mrs. E. A.	Michigan	720	Pension	July 15	Laborer; exempt.
Kirschner, Herman	Dist. Columbia	720	Secretary's	July 16	Watchman; exempt.
Harbin, Thomas M.	Alabama	720	do	July 16	Do.
Appleton, W. H.	New Hampshire	1, 200	Patent	July 16	Stenographer; exempt.
Freund, L. P.	Illinois	1, 600	do	Aug. 1	Appointed under the rules.
Wynne, L. B.	Dist. Columbia	1, 200	do	Aug. 1	
Holston, D. K.	Ohio	1, 200	do	Aug. 1	
Brashears, Shipley	Maryland	1, 200	do	Aug. 1	Messenger; exempt.
Church, J. B.	Dist. Columbia	1, 200	do	Aug. 1	
Barnes, J. W.	Ohio	720	Pension	Aug. 1	
Allen, Mrs. Harriet	New York	840	do	Aug. 13	Laborer; exempt.
Woolley, George A.	Virginia	720	Land	Sept. 1	Messenger; exempt.
Jackson, Louis	Dist. Columbia	720	Pension	Sept. 1	Do.
Osgood, Worth	New York	1, 400	Patent	Sept. 12	Appointed under the rules.
Cooke, L. M. E.	Dist. Columbia	1, 400	do	Sept. 15	
Buchanan, Roberdeau	Massachusetts	1, 000	do	Sept. 15	
Freeman, F. L.	do	1, 400	do	Oct. 1	Appointed under the rules.
Durrall, J. B.	Colorado	1, 400	do	Oct. 1	
Chadsey, W. H.	California	1, 400	do	Oct. 1	
Rockwell, H. E.	Dist. Columbia	1, 800	Education	Oct. 1	Stenographer; exempt.
Hastings, Charles W.	Massachusetts	600	Indian	Oct. 1	Messenger; exempt.
Kuehne, Augustus	Kentucky	720	Secretary's	Oct. 3	Watchman; exempt.
Robinson, Clem	Virginia	720	do	Oct. 25	Messenger; exempt.

EMPLOYÉS IN THE INTERIOR DEPARTMENT.

3

A statement of the employés of the Department of the Interior, &c.—Continued.

Name.	State.	Salary.	Office.	Appointed.	Remarks.
Lathop, S. F.....	Pennsylvania. . .	\$1, 200	Patent	Nov. 1	Special duty; exempt.
Decker, William T.....	Ohio	720	Secretary's	Nov. 22	Watchman; exempt.
Heaton, Mrs. Lucy.....	Indiana	720	Pension . . .	Dec. 7	Laborer; exempt.
Engle, John S.....	Pennsylvania . . .	720	Secretary's	Dec. 16	Watchman; exempt.
McKinney, Mrs. F. A . . .	New York	720	Pension . . .	Dec. 20	Laborer; exempt.
Garnett, R. P. W.....	Virginia	720	do	Dec. 22	Messenger; exempt.

Appointed previous to April 16.....	34
Appointed under the rules.....	12
Exempt under the rules	34
Total	80

Statement of the Receipts and Disbursements of the General Land Office for the Year 1880

Year	Receipts	Disbursements	Balance
1879			
1880			
Total			

.....

WORKS ON RIVERS AND HARBORS.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The repair, preservation, and completion of certain public works on rivers and harbors, &c.

FEBRUARY 11, 1873.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT, *February 8, 1873.*

The Secretary of War has the honor to submit to the House of Representatives the accompanying additional reports of examinations and surveys, made in compliance with the second section of the act approved June 10, 1872, making appropriations for the repair, preservation, and completion of certain public works on rivers and harbors, &c.

WM. W. BELKNAP,
Secretary of War.

OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., February 8, 1873.

SIR: The following additional reports of examinations and surveys, made in compliance with the second section of the act of June 10, 1872, making appropriations for the repair, preservation, and completion of certain public works on rivers and harbors, &c., are respectfully transmitted herewith.

1. *Rouse's Point Harbor, New York.*—This harbor is naturally well protected on the east and north, but much exposed to southerly storms which prevail there, and the object of the improvement is protection from their effects. To this end the engineer officer in charge of this examination, Lieutenant-Colonel Newton, recommends interposing a breakwater in two sections between Windmill and Stony Points, the upper section to be about 1,900 feet and the lower 1,400 feet in length, to be of crib-work similar in construction to that at Plattsburgh, at an estimated cost of \$336,000.

2. *Swanton Harbor, Vermont.*—Swanton is a manufacturing town and a station of the Vermont Central Railroad, fifteen miles from Rouse's

Point and ten from Saint Albans. The junction of the Montreal and Vermont and of the Vermont Central Railroads is at this point. The village is two miles distant from the harbor on the lake, and has as yet no railroad connection with it, but on the completion of the Portland and Ogdensburgh Railroad, now being constructed, the harbor will be put in connection with the general railway system of that region. The principal demand for works of protection at this harbor refers, therefore, to a future development of commerce due to these connections with existing routes by rail and water.

The full project presented by Lieutenant-Colonel Newton, the officer of engineers in charge of the examination, consists of a breakwater of crib-work, similar to that at Burlington, 1,900 feet long, at an estimated cost of \$272,000. At first, and until the trade has become more fully developed, only a portion of this need be constructed, as it can be extended outwardly as the business of the place increases.

3. *Keyport Harbor, New Jersey.*—The improvement suggested here by the engineer officer in charge of this examination, Lieutenant-Colonel Newton, is deepening the approach to the Keyport wharf by dredging a channel 200 feet wide and about 4,700 feet long to a depth of 8 feet below mean low water, at an estimated cost of \$30,000.

The bed of the harbor in and near the main channel consists of clay and fine sand, and the maximum velocity of the tidal currents is not sufficient to affect the stability of the river-bottom. An improvement by dredging would therefore probably be of benefit for a long period.

4. *Survey of the Delaware River between Trenton, New Jersey, and Easton, Pennsylvania.*—A preliminary report of this examination was transmitted with my letter of the 11th January last, as printed in Senate Ex. Doc. No. 25, of the present session of Congress. The probable cost of the improvement of this portion of the river was there set down at \$20,000.

The revised estimates embraced in the report now submitted by Lieutenant-Colonel Kurtz increase the amount to \$26,000. This report shows the character and condition of the river between Easton and Trenton; the history and extent of the lumber trade upon it; the improvements heretofore made by State appropriations and personal efforts; the jurisdiction exercised by Pennsylvania and New Jersey over the river; their legislation respecting it, and the questions arising between the several interests concerned in its waters and along its shores.

The funds allotted for this examination from the appropriation of June 10, 1872, having proved insufficient, the engineer in charge acknowledges the assistance of a number of gentlemen living upon the river in supplying the deficiency, without whose aid the survey could not have been completed at this time.

5. *Survey of the bay and sound from Delaware line through Worcester County, Maryland, and Chincoteague Inlet, Virginia, with a view to an inlet at or near a place called "The Hommacks."*—A preliminary report of the results of this survey was forwarded with my letter of the 11th ultimo. In the final report now submitted, Lieutenant-Colonel Kurtz, engineer officer in charge, retains the former estimate of \$120,600, with the remark that it is at full quantities and prices to cover unfavorable circumstances. If these should not occur there will be a reduction of the expenditure. The question of the permanence of the inlet when made is discussed by Lieutenant-Colonel Kurtz in this report with the conclusion that it may be reasonably expected.

6. *Mouth of Mackay's Creek and harbors of Washington and Edenton, North Carolina.*—The improvement proposed for Mackay's Creek by the

engineer officer in charge of these examinations, Major Craighill, consists of the removal of the wreck of a small schooner and the dredging of a channel 60 feet wide to a depth of 7 feet from the mouth of the creek out until the same depth is reached in the sound, at a cost of \$5,000.

The proposed improvement for Edenton seems to be the excavation of a channel 100 feet wide and nine feet deep from the town to the deep water of the bay, at a cost of about \$10,000.

The obstructions to navigation near Washington, partly natural and partly artificial, are more serious than at Edenton or Mackay's Creek, owing to their extent and the cost of remedying the difficulties caused by them.

The estimates herewith given contemplate the removal of piles and sunken logs, dredging, and the construction of a long dike for contracting the too broad estuary below the town, and directing the flow of the water into the dredged channel of 9 feet in depth. The cost is stated to be about \$35,000.

The above-mentioned improvements would, it is believed, contribute greatly to the general good of that section of the country.

7. *Waukegan Harbor, Illinois.*—A harbor at this place must be entirely artificial, as the creek which here empties into the lake is of no value for harbor purposes. The commerce of the place is small, and from the accompanying report would not appear to warrant any expenditure for local purposes.

The engineer officer in charge, Major Houston, reports, however, that a harbor of refuge somewhere in this vicinity, affording easy access to vessels of all classes, would be of great benefit to commerce. The nearest harbors are Chicago, thirty-six miles south, and Kenosha, sixteen miles north; the latter not at present deep enough to admit vessels of the largest class. The nearest harbor north affording security to vessels of all classes is Milwaukee, distant fifty miles. There is, then, a length of coast of eighty-six miles where vessels of the larger class can find no shelter.

Waukegan may not, perhaps, prove to be the best locality for such a harbor; a careful examination of this portion of the lake-coast should be made with this view before any locality is fixed upon.

Major Houston estimates the cost of an exterior harbor of refuge at Waukegan to be about \$800,000.

8. *Mouth of Pensaukie River, Wisconsin.*—This river empties into Green Bay on the west side, about twenty-five miles from the mouth of Fox River. Vessels drawing 5 feet are now enabled to enter, owing to improvements made by owners of saw-mills near the mouth. An increase of this lepth would serve to develop the business of the place, and of the country adjacent.

The engineer officer in charge, Major Houston, reports that, to enable vessels usually navigating the lake to enter, the present depth may be increased by dredging, and when dredged, piers should be constructed to prevent the channel from filling up. These piers, owing to a reef one and a half miles north of the river-mouth, which breaks the force of storms, can be slab-piers, a cheaper construction than that usually resorted to. He submits the following estimates for this improvement:

For a 9-foot channel:

Dredging	\$63,000
Piers	59,000
Contingencies	12,000
Total	<u>134,000</u>

For a 12-foot channel:

Dredging	\$73,000
Piers	111,000
Contingencies	18,000
Total	<u>202,000</u>

9. *Survey for the removal of wrecks of gun-boats, steamers, and other obstructions placed in the Yazoo River during the war.*—Colonel Simpson, the engineer officer under whose direction this examination was made, reports the existence of nineteen wrecks which are obstructing navigation, and recommends the removal of eight of them as being the worst obstructions, estimating the cost at \$40,000.

The removal of the whole number would cost about \$95,000.

Very respectfully, your obedient servant,

A. A. HUMPHREYS,
Brigadier-General and Chief of Engineers.

Hon. W. W. BELKNAP,
Secretary of War.

I.—ROUSE'S POINT HARBOR, NEW YORK.

UNITED STATES ENGINEER OFFICE,
New York, January 20, 1873.

GENERAL: I have respectfully to make a report upon the survey and projected improvement of Rouse's Point Harbor, according to the requirements of the act approved June 10, 1872.

I transmit herewith copy of report and chart furnished by Mr. D. White, under instructions from this Office.

The object of the improvement was well understood to be the protection of vessels in the trade with Canada, and of vessels engaged in the local trade, from the effects of storms.

It is unnecessary to go into further detail, as the inclosed report of Mr. White will furnish the requisite information.

The position and lengths of the breakwater, as projected by Mr. White, are delineated in red. I have considered it proper to make a change in positions and lengths, and the breakwaters recommended are indicated in blue. Possible future extensions of the breakwaters are represented in blue dotted lines. I have omitted the estimate for dredging the Rouse's Point reef.

Estimate for breakwater.

Upper breakwater, 1,900 feet long	\$159,770 00
Lower breakwater, 1,400 feet long	132,405 00
Contingences, 15 per cent	43,826 25
Total	<u>336,001 25</u>

The upper breakwater is 20 feet wide, except for the last 200 feet toward the channel, where it is increased to 25 feet. The lower breakwater is 20 feet wide, except the last 300 feet, where it is 25 feet.

Respectfully submitted.

JOHN NEWTON,
Lieutenant-Colonel Engineers, Brevet Major-General.

General A. A. HUMPHREYS,
Chief of Engineers, Washington, D. C.

FORT MONTGOMERY, ROUSE'S POINT, NEW YORK,
January 6, 1873.

GENERAL: I have the honor to submit the following report of the examination and survey of Rouse's Point Harbor, New York, made in conformity with your instructions under date of August 5, 1872, with a view to the construction of a breakwater, and other improvements at this point, as a means of providing for the safety of vessels plying between ports on the Saint Lawrence and Lake Champlain, which enter and clear at this harbor, and those engaged in such transshipments as center at this locality.

Rouse's Point Harbor, or Port, lies at the west shore of Lake Champlain, about one and one-half miles above its confluence with the Richelieu River, water communication being made northward with the Saint Lawrence at Sorel, and southward with Whitehall, at the head of the lake. The harbor is thus at the foot of lake navigation, and in the natural commercial highway between the Hudson and the Saint Lawrence Rivers, with railroad connections to the north, south, east, and west.

While at this "outlet," on either side, are the "ports of entry" for the sixteenth collection district of New York, and that of Vermont. The harbor lies in a shallow bay, formed by Rouse's Point on the north, and Stony Point on the south, and with the Vermont shore on the east, embracing a length of coast of about two miles.

The lake along the harbor has a width of about one mile; its maximum rise above the plane of low water is about 7 feet, with a velocity at low water of 1,754 feet per hour; anchorage bottom good, being composed of clay, stone, sand, and gravel; the depth of water within the harbor is ample at all seasons of the year, except upon "Rouse's Point Reef," where it has a depth of only about $4\frac{1}{2}$ feet, and is thus too shallow to admit vessels of any size during the lower stages of the lake. This reef extends from Rouse's Point, in a southerly direction, for a distance of 1,700 feet, and has an average width of about 200 feet; it is apparently composed of clay, gravel, and stone, the latter varying from 10 to 150 pounds in weight, except that portion lying south of the railroad bridge, where the stones are somewhat larger and lie loosely, the clay having been washed out from between them. This section of the reef is very troublesome to vessels passing between the wharves and channel.

At the lower end of the harbor is the terminus of the Ogdensburgh and the Champlain and Saint Lawrence Railroad; here connection is formed between them, and the Vermont Central Railroad, by a bridge across the lake.

In this bridge, about 2,200 feet from the west shore, provision is made for the passage of vessels up and down the stream by the insertion of a rotary "draw," which, when out of position, (or open,) leaves a passage of 90 feet at either side of the central pier. At the west end of this bridge, and extending southward along the harbor, are the extensive wharves of the Ogdensburgh Railroad Company, and those owned by private parties, forming the principal wharfage facilities of this port, where the transshipment of freight is carried on between the railroads and the connecting lines of steamers and sail-craft; while above these, opposite Windmill Point, is located another wharf of considerable size, for the reception of coal and the transaction of local business.

This harbor on the east and north is naturally well protected, but is very much exposed to southerly storms, which are the prevailing ones in this locality.

The lake lies in nearly a right line north and south; is about one hundred miles in length, with a varying width, its greatest width being about twenty-three miles, south of Rouse's Point, from which point its shores gradually converge. The intervening islands not being sufficient to impede the violence of the storms, the volume of the lake sweeps down with increasing strength toward its outlet, where, on reaching the upper end of the harbor, the lake is abruptly contracted by the projection of Windmill Point from the east shore, the water set back by the bay thus formed on the right continually flanking the main volume at its egress, which, here concentrated from its greater magnitude southward, causes the waves to roll in upon the harbor with great force, rendering it impracticable for vessels to pass either way through the draw, or lie at the windward side of the wharves with any reasonable degree of safety. Consequently, during the prevalence of these southerly storms, vessels, sail-craft, and steamers, the latter each with its tow of barges or rafts, measuring from 500 to 200 feet in length, in coming from the north have to remain below the bridge, and those northward-bound, as well as those exchanging their cargoes in the harbor, are compelled either to seek shelter at the leeward side of the wharves, or run the risk of injury in passing the draw for that object, it being considered dangerous to lie at anchor, in a gale, above the bridge, all of which causes serious delay to commerce. Therefore, the main improvement required for this harbor is an increased depth of water upon that portion of Rouse's Point Reef lying south of the bridge, and protection from southerly storms of the draw and line of wharves along the harbor-front, and anchorage facilities to enable vessels to lie securely (at anchor) above the bridge while passing inspection at either custom-house, as well as in cases where the storm is too severe to admit of proceeding on their passage up the lake.

With this end in view, which the important interests of commerce would seem to

demand, after a careful consideration of the subject, I would respectfully recommend the following improvements :

First. Dredge out that portion of Rouse's Point Reef lying south of the bridge, to a depth of 8 feet below the plane of low water. This will require the removal of 11,200 cubic yards of stone, clay, &c., at 70 cents per cubic yard, \$7,840.

Secondly. Interposing 2,600 linear feet of breakwater in two sections between Windmill and Stony Points, the upper section to be 1,200 and lower 1,400 feet in length.

It is believed that by thus placing two breakwaters of the above lengths respectively at either side of the channel, one above the other, and slightly oblique to the axis of the waves, as shown in the accompanying map, that the waves will be broken and so deflected to the right as to secure the desired improvements, without at the same time producing any appreciable effect upon the natural discharge of the lake, or proving an essential impediment to vessels in passing out and in. It is proposed to build this breakwater of crib-work, similar in construction to that at Plattsburgh, the cribs to be 100 feet in length each, and 20 feet wide.

The estimated cost, including labor, is as follows :

379,080 cubic feet square pine-timber, at 33 cents	\$125, 096 40
78,000 feet, board measure, 3-inch pine-plank, at \$35	2, 730 00
249,600 pounds drift-bolts, at 7 cents	17, 472 00
5,200 pounds 6-inch wrought spikes, at 8 cents	416 00
24,960 tree-nails, at 8 cents	1, 996 80
33,644 cubic yards rubble-stone, at \$1	33, 644 00
	181, 355 20
Contingencies, 15 per cent	27, 202 80
Total	208, 558 00

Making the probable cost of the improvement \$216,398.

The following schedule shows the business of the harbor for the year ending December 31, 1872: Vessels passing through the "draw" and entered and cleared at either port, 7,155; tonnage of the same, 708,951; value of imports, \$3,170,136; duty probably accruing to the United States therefrom, \$500,000.

Steamers and sail-craft arriving at and departing from the harbor, southward, not passing the "draw," 2,000; freights transshipped at this port, 67,262 tons; value, \$2,367,525.

The foregoing is taken from the accompanying statistical report furnished by the Rev. D. T. Taylor, secretary of the Rouse's Point board of trade.

As this outlet lies within the limits of the collection districts of two States, with their respective ports of entry for foreign trade, Rouse's Point, and Windmill Point, at either side, the improvement proposed would be alike beneficial to each, and both general and national in its character.

Very respectfully, your most obedient servant,

D. WHITE,
Superintendent and Engineer.

Brevet Major-General JOHN NEWTON,
United States Engineers.

ROUSE'S POINT, NEW YORK, *January 6, 1873.*

DEAR SIR: In compliance with your request, I now furnish a statement of the trade and commerce of and touching at this port, together with an exhibit of the increase of the same during the last twenty-five years.

Since the era of the introduction of steamboats on Lake Champlain in 1809, there have been built on this water over thirty steamers; about one-half of these were first class, the remainder being second class, to which, if we add such vessels as come from Canada, it is probable the total steamboats that have navigated these waters would amount to the number of fifty. During the past season, three first-class steamers have made daily trips to this port from Whitehall, New York, and the travel on them has exceeded that of any previous season, while the amount of freight conveyed hither by them for the trade of Northern New York is very considerable. Besides the above regular line boats, the lake is navigated at the present time by a score of second-class steamers, side-wheel and propellers, engaged in transporting freight, and conveying hundreds of canal-boats and barges freighted with lumber and merchandise to and fro, forming the immense and increasing carrying-trade of the lake. The whole number of vessels of all descriptions now operating in the commerce of the lake is nearly seven hundred. These vessels land at this port, or pass and re-pass the draw of the great bridge, between eight thousand and nine thousand times during the

season; the passage of single cargoes sometimes reaching six hundred per month while the total tonnage of vessels engaged in the commerce and carrying-trade on these waters is from 10,000 to 12,000 tons.

From Ottawa and Montreal to Albany and New York, a distance, in the extreme, of over five hundred miles, exists an unbroken water communication. On this long route all vessels inward or outward bound are compelled to pass, to clear or enter at this outlet of Lake Champlain. Very fitly has this outlet been styled "the key of Canada." Vermont has her custom-house at the draw, and of the entire district of Champlain, extending westward nearly one hundred miles, and southward a similar distance, full seven-eighths of all the duties are collected at the Rouse's Point port of entry. The commercial importance of this locality is, therefore, at once perceived. Every day over thirty vessels pass the custom-houses on either side of the draw. Endless stores of Canadian lumber are almost continually in sight. Burlington, Vermont, third in magnitude in its lumber interests in our country, receives all her lumber by the way of this outlet. Each and every vessel coming from any or every direction, while making the passage of this port, is compelled to lie to in an exposed harbor, at present totally unprotected by artificial improvements.

Commerce on this route is year by year increasing, and a comparison of statistics of different dates will serve to show the rate of this increase. For example, in 1852 there were 342 vessels, of 22,538 tons, entered at Rouse's Point, and a far less number on the Vermont side; but in 1871 there were 3,072 vessels, of 259,460 tons, entered at the two ports that lie either side of this outlet, and this last number was increased by over 500 vessels during the following year, while the facts exhibit a satisfactory increase of United States over Canadian vessels, and thus a greater transfer of commerce to American bottoms.

Again please observe that in 1858 there entered into the Champlain district from Canadian waters 1,100 vessels, of 78,256 tons; into the Vermont district, 631 vessels, of 42,099 tons; total, 1,731, of 120,355 tons. But ten years later, in 1868, there entered into the Champlain district from Canada 1,897 vessels, of 149,263 tons; and into the Vermont district, 942 vessels, of 70,267 tons; total, 2,839 vessels, with a tonnage of 219,530 tons; an increase both in vessels and tonnage of 80 or 90 per cent. But three years later the vessels entering at both ports had increased to 3,072, and their tonnage ran up to 259,460 tons, an increase of tonnage of over 100 per cent. beyond the year 1858, while in a single year, ending 1872, both the size and number of vessels had largely increased.

Noticing more especially the last two years, we find the figures of commerce touching at this harbor to be as follows, namely: the number of American vessels that entered and cleared at the Champlain district during the season of 1872 was 2,507; British or Canadian vessels, 1,422; total, 3,929, with an aggregate tonnage of 291,313 tons; while on the Vermont side there were entered and cleared 3,226 vessels, of 417,638 tons, showing a total of 7,155 vessels, with a capacity of 708,951 tons. We have here, both in carrying and going, an increase of over 1,000 vessels beyond the year 1871, with a corresponding increase of tonnage.

The total value of the imports of the vessels inward-bound amounted to over \$3,100,000, and the revenue accruing to the Government therefrom was about half a million of dollars, (which please compare with the fact that for a period of twenty years previous to 1848 the gross revenues of both ports did not much exceed an average of \$10,000 per annum.)

In conclusion, you are invited to consider that nearly 33,000 tons of iron and ore were landed at our wharves in 1872, which is an increase of nearly 20,000 tons in one year; that from 10,000,000 to 12,000,000 feet of lumber were shipped from our wharves the past year, where five years ago none was shipped; that the local trade in coal reaches 5,000 tons, whereas five years ago it did not amount to 500 tons; and finally, that the freight of all kinds brought into, and conveyed out of, our harbor is fairly estimated, in the aggregate, to annually amount to over 67,000 tons, having a value of several millions of dollars. (See schedule and other documents accompanying this statement.)

I beg leave to remark, as a final conviction, that there touches and radiates from this port such vast commercial and moneyed interests, both public and private, and involving a wide-spread community of persons, as calls for every needful protection by the Government, into whose treasuries flow large revenues derived therefrom.

I am, very respectfully, yours,

DANIEL T. TAYLOR,

Secretary of the Board of Trade, Rouse's Point, New York.

DAVID WHITE,

Civil Engineer.

SCHEDULE OF BUSINESS.

The following schedule exhibits the statistics of the business in commodities, tons,

and value of freight loaded and unloaded at the wharves and depot of this port, and also the lake commerce in transit, during the year 1872;

Articles.	Estimate of tons.	Value.
Clapboards received and shipped, 200,000	65	\$2, 200
Lumber manufactured from log, 100,000 feet	200	2, 000
Lumber received (by Velie & Co.) and shipped, 410,500 feet...	600	8, 200
Shingles manufactured, and in part shipped south, 2,000,000..	240	7, 000
Laths received and shipped, 8,500 bundles	250	2, 100
Hay unloaded from cart and car for transportation south and east	905	13, 575
Soap manufactured and sent away by boat and rail	100	35, 000
Lumber received (at the yard of R. W. Adams & Co.) for ship- ment south and east, 7,200,000 feet, (96 cargoes)	15, 000	100, 000
Lumber received by boat (at the yards of J. R. Booth) and shipped south, 3,176,004	6, 616	63, 500
Hay unloaded from vessels for transportation by cars, 12 cargoes	1, 370	20, 550
Coal (by Messrs. Myres & Crook) for steamboat, railroad, and local use, unladen from vessels	5, 000	35, 000
Coal unloaded from lake vessels for transportation by cars going west	700	4, 900
Merchandise of dry-goods, provisions, groceries, drugs, hard- ware, &c., received mostly by boat, for local trade	275	126, 000
Merchandise shipped southward on lake steamers, the same having been brought from Canada by rail	245	122, 500
Merchandise unloaded from lake vessels for transportation by cars to the west	1, 423	711, 500
Merchandise unloaded from lake steamers for transportation by rail to Canada	1, 573	786 500
Iron and iron ore received, from lake vessels and reloaded in cars going west	32, 700	327, 000
Total	67, 262	2, 367, 525

D. T. TAYLOR,
Secretary Board of Trade, Rouse's Point, New York.

APPENDIX.

Vessels entered and cleared that pass through the "draw," 7,155; tonnage, 708,951.

Value of the total imports received from Canada, \$3,170,136.

Duty, probably collected by United States on the above, \$500,000.

Steamers and sail-vessels arriving and departing to and from the harbor of Rouse's Point which do not pass the draw but load and unload at our wharves, 2,000.

D. T. TAYLOR,
Secretary Board of Trade, Rouse's Point, New York.

FORT MONTGOMERY, ROUSE'S POINT, NEW YORK,
January 28, 1873.

GENERAL: In pursuance of your letter of the 18th instant, I have the honor to report that application was made to the collector at Rouse's Point for the information called for in your communication, which was given as far as he had records to show. This, however, not answering fully in regard to the number of passages made by domestic vessels engaged in the coasting trade with Rouse's Point and other home ports, with tonnage and merchandise, application was immediately made to the superintendents and secretaries of the several transportation lines for the desired information, but the statements thus received are not as full as your letter calls for, owing to want of time to collect the data, especially in regard to values.

* * * * *

In aggregating these several statements the following results are obtained, viz :

The number of passages made by vessels trading between Canada and Rouse's Point :

Vessels entered and cleared, 3,929 ; tonnage, 2,913.03.

Value of cargoes, \$3,137,529.

Number of passages made by domestic vessels engaged in coasting trade with Rouse's Point and other home ports, with tonnage and merchandise, as far as given :

Domestic and freight goods arriving by vessels and exported via Grand Trunk Railway, \$157,125.

Vessels departing from and arriving at Rouse's Point, 3,749 ; tonnage, 867,570.

Value not stated.

Very respectfully, your most obedient servant,

D. WHITE,
Superintendent and Engineer.

Brevet Major-General JOHN NEWTON,
United States Engineers.

II.—SWANTON HARBOR, VERMONT.

UNITED STATES ENGINEER OFFICE,
Houston and Greene streets, New York, January 21, 1873.

GENERAL: In conformity with the provisions of the act approved June 10, 1872, I have respectfully to forward map of survey of Swanton Harbor, Vermont, with copy of report of Mr. D. White, civil engineer with the inclosures named therein.

By the inclosures aforementioned it will be clearly perceived that the principal demand for works of protection at this harbor refers to a future development of commerce due to the proposed completion of the Portland and Ogdensburgh Railroad, and its connections with existing routes by water and by rail.

The general position and length of the breakwater, as designed by Mr. White, fulfill the required conditions.

The necessary slight changes and deviations therefrom could with propriety be made hereafter, in case Congress should make the necessary appropriations.

It would be highly proper, if not essential, to require the parties interested to construct first the uppermost wharf, and then to commence the breakwater at the point nearest the shore, building it only so far year by year as would be necessary to cover the wharves as they are built in regular order from the first position as above described.

Estimate.

For 1,900 linear feet of breakwater.....\$272,160

Respectfully submitted.

JOHN NEWTON.

Lieutenant-Colonel Engineers, Brevet Major-General.

Brigadier-General A. A. HUMPHREYS,
Chief of Engineers, Washington, D. C.

FORT MONTGOMERY, ROUSE'S POINT, NEW YORK,
December 27, 1872.

GENERAL: I have the honor to submit the accompanying maps, marked A, B, and report of a survey of Swanton Harbor, Vermont, made in compliance with your instructions, dated August 5, 1872.

Swanton Harbor is situated at the left shore of an arm of Lake Champlain, lying east of Alburgh Tongue. This arm has its entrance at a point twelve miles above the

outlet of the lake, and extends, in a northeasterly direction, across the northwest corner of the State of Vermont, for a distance of eighteen miles, and has a width varying from four to five miles, except for a short distance, at a point seven miles above its entrance, where, by a peninsula known as "Hog Island," extending from the eastern shore, it is reduced to about one mile in width. The extreme points of the head of this peninsula extend a considerable distance above and below its neck, and form, together with the main-land, deep semicircular bays at either side, the one on the right being known as "Missiscoi Bay," and that on the left, and facing the entrance of the arm, "Maquam Bay." Here, at the foot of Maquam Bay, and extending along the main shore, in a southerly direction, lies the harbor. The harbor is thus naturally well protected on the north and west, but exposed to southwesterly storms, and it is here at its upper end that the construction of a breakwater is sought, to give to the harbor the additional security it thus requires.

The wharfage facilities for the last twenty-five years consisted of one small dock at its lower end, which, however, during my survey in September last, was being superseded by the construction of a more substantial one, 170 feet in length and 60 feet in width, which, I was told by the engineer in charge, was the first one of a series of docks which the Portland and Ogdensburgh Railroad Company proposed to construct here, should the commerce of the harbor sufficiently increase to require them, the position and figure of which may be seen by a reference to map A, of the maps A and B, herewith transmitted.

The harbor abreast of the proposed wharves has a good depth of water; the bottom is composed of stone, clay, sand, and mud, and the channel from the harbor to the main lake is said to carry a minimum depth of 17 feet. Below the wharves, however, and extending to the bottom of the bay, is an extensive alluvial deposit, rendering the water too shallow for purposes of navigation during the lower stages of the lake. This shoal or flat is an accumulation of silt, brought down many years ago by Charcoal Creek, which formerly debouched in at the bottom of the bay, but which long since became extinct.

The harbor is thirteen miles distant from the main commercial channel of the lake, and is thus accessible to vessels from all points. The shore along the harbor, and extending southward for several miles, is bold and firm, being composed of rock, stone, and clay and gravel, and the adjacent lands have a good elevation above the plane of the lake, and receding from the shore with a slight acclivity, and well adapted to either agricultural or commercial purposes.

The town of Swanton, from which the harbor derives its name, is situated inland about two miles east of the harbor, upon the north bank of Missiscoi River. This river takes its rise in Canada, at the northeast corner of Franklin County, Vermont, and from thence, flowing in a southwesterly direction, through the towns of Richford, Enosburgh, Sheldon, Highgate, and Swanton, empties its waters into Missiscoi Bay, the stream at Swanton and several points above it affording some very fine mill-sites. Swanton is a manufacturing town, and a station of the Vermont Central Railroad, between Rouse's Point and Saint Albans, being distant fifteen miles from the former and ten from the latter. The junction of the Montreal and Vermont and Vermont Central Railroads is also made at this point, but as yet, however, it has no railroad communication with the harbor, which latter, although an old port, has hitherto had but a limited local business. But on the completion of the Portland and Ogdensburgh Railroad, now in process of construction, it will be put in connection at Swanton with the Vermont Central, and thence, with the general railway system of the country, which, together with the full development of the other projects set forth in the certified statement herewith transmitted, ought to make this an important commercial center. These projects, however, are not sufficiently developed to require such extended improvements as may be in future desired, as may be seen by reference to Map A. To cover the whole series of docks will require 1,900 linear feet of breakwater.

It is therefore respectfully proposed to give to the harbor the protection it needs; but in view of the contingency involved, to request of the railroad company that they develop their series of docks from the upper instead of the lower end of the harbor, and to commence the breakwater at its shore (east) and only extend it outward as the business of the harbor may hereafter require.

It is proposed to build this breakwater of crib-work similar in construction to that at Burlington, Vermont. The cribs to be 100 feet in length each, and 25 feet in width; the estimated cost of which, including labor, is as follows:

For 1,900 linear feet of breakwater completed:

492,622 cubic feet square pine timber, at 33 cents.....	\$162,565 26
57,000 feet (board measure) 3-inch pine plank, at \$35.....	1,995 00
257,450 pounds drift-bolts, at 7 cents.....	18,021 50
3,890 pounds 6-inch spikes, at 8 cents.....	304 00

40,432 tree-nails, at 8 cents	3, 234 56
50,540 cubic yards rubble-stone, at \$1.....	50, 540 00
	236, 660 32
Contingencies, 15 per cent	35, 499 68
Total.....	272, 160 00

Swanton Harbor is in the collection-district of Vermont. Fort Montgomery, at the outlet of Lake Champlain, is the nearest fort, and the nearest light-house that at Windmill Point.

Accompanying this report is a communication from A. B. Jewett, esq., of Swanton, Vermont, containing a statement of the business of Swanton and Swanton Harbor for the year 1872.

Very respectfully, your most obedient servant,

D. WHITE,
Superintendent and Engineer.

Brevet Major-General JOHN NEWTON,
United States Engineers.

Business interests depending upon the construction of a breakwater at Maquam Bay.

The undersigned, citizens of Vermont and in part of Maine, upon the above topic, respectfully set forth as follows :

Of the adaptation of Maquam Bay to the purposes of commerce, in its accessibility from the main lake, its depth of water, its conveniences for docks, in the favorable shape of the bordering land with reference to the storage of merchandise and the location of a town, it is not necessary for us to speak, the same having been duly set forth in the report of the United States engineer under whose direction the survey of the harbor has been made. In the same report the necessary information is embodied, touching the breakwater, for which appropriation by Congress is sought, and which is indispensable for the protection of shipping at this point.

It remains to show what important business interests will be subserved by the proposed expenditure, by the establishment of a good and safe haven for shipping at the locality proposed. These interests are an important part now existing and in urgent demand of improvement sought. In part they are prospective and are to result from the development of resources now dormant or inadequately used. This development will itself be variously initiated or promoted by the harbor improvement in view. Either one of the classes of interests specified is believed to be of sufficient importance to justify and require the appropriation desired.

COMMERCIAL POSITION.

We observe at the outset that the harbor in question has an exceptionably important commercial position. It is located at the point where Lake Champlain, having divided the country asunder for one hundred and fifty miles to the southward, first permits the passage of railroads east and west. By and at this point, over half of New England will gain most convenient access to the West, and a vast territory in the West find its shortest route to the sea. At this point, accordingly, railroads are already concentrated from the north, south, and west, to which one from the east, another to the north, and still another to the west, will speedily be added. This is, in short, a great natural railroad center. A large amount of merchandise already passes and re-passes by rail at this point, the bulk of which must continue to rapidly increase.

The line of railroad leading east from Maquam Bay, through which access to a territory at present unfurnished with railroads is to be secured, and shortest access to the ocean, namely, the Portland and Ogdensburgh Railroad, has now one hundred and twenty miles of the total two hundred and twenty-six in operation, and work vigorously prosecuting upon the unfinished portion. Abundant means are provided to complete the road, which will be opened through at an early day. This line is to be extended westward, from Maquam Bay to the Great Lakes, and north to Montreal, charters already being secured and the money, in part, raised. It will embrace upon the lake, at Maquam Bay, with all needed facilities for receiving, handling, storing, and forwarding freight. By this line merchandise and produce drawn from the country contiguous to the Great Lakes, transferred to rail at Maquam Bay, can reach a large territory on the east and southeast, at lower cost than by any other route, and can also reach tide-water for distribution coastwise and beyond sea, on terms competing with the cheapest.

From Maquam Bay to Portland, Maine, is but two hundred and twenty-six miles, which measures the length of land transportation from Chicago, Duluth, and other lake ports to the Atlantic by this route.

The other great line of railroad which controls the routes at present in operation, south, west, and north, from Maquam Bay, the Vermont Central Railroad affords additional outlets to an extensive territory. This line, also, will extend its rails to the docks, at Maquam, and will transact a portion of its Lake Champlain business at this point. It will be for its interest to do so, rather than wholly at Burlington, and for the interest of the commerce likewise, as greater dispatch can be secured.

Yet, further, the great water system of the Saint Lawrence, including some two thousand five hundred miles of navigable lake and river, is already connected with Lake Champlain by river and canal, a canal of far greater capacity being in prospect. This places Maquam Bay in connection, by water transportation, with a million square miles of productive country tributary to the Great Lakes, the Saint Lawrence and its affluents.

Maquam has connection, also, with the Hudson River through the canals, and connection in consequence by water with New York and other tide ports. This is in fact a natural distributing point, lines of rail from an extensive area finding here their only practicable passage, and water-lines extending north and south, and at a short remove, east and west likewise, to the ocean and the head of the Great Lakes.

Having thus briefly noticed the important commercial position and advantages of the port in question, we proceed to remark in detail upon some of the branches of industry that would be prosecuted at this point, suitable harbor protection being secured.

LUMBER.

Some 240,000,000 feet of lumber are cut yearly at Ottawa and Hull, in Canada, or including the Gatineau, and various points to Grenville, 303,000,000 feet. Of this about 190,000,000 feet are brought into the States, much the larger part through Lake Champlain. Burlington receives yearly about 120,000,000 feet, mainly from this source of supply. An important part of this lumber can reach the consumer most directly and cheaply by transfer from barge to rail at Maquam Bay, avoiding circuitous routes.

As destined to towns upon the New England sea-board, the line via Maquam and the Portland and Ogdensburgh Railroad and connections becomes an equal competitor with any other. Unquestionably a large lumber trade will be established at this point should the harbor be made safe for shipping. The land inshore is disposed, without grading, filling, or other preparation, for the reception and convenient handling of an indefinite amount of bulky commodities, space for which has usually to be made ready at large outlay.

It is intended to establish at once a very large mill for "finishing" lumber at Maquam. A party already extensively engaged in the business elsewhere having it in view to remove to this point, as the best point known to him, a charter of a manufacturing company has just been procured from the Vermont legislature by a combination possessed of ample means, who likewise propose large operations in lumber, or some other branch of manufacture, at the same point.

COAL.

Coal can be laid down at Maquam Harbor as at Burlington for \$1.75 per ton for freight from the coal ports of the Hudson River.

The coal will circulate from this point as far east as the White Mountains, also via the southeast counties railroad connection, through a considerable territory in Canada. Coal is coming to be largely used, even in the rural districts, for domestic purposes, wherever railroads are opened within the distance of ten miles, the extreme severity of the winter in these high latitudes making the permanent and lasting fuel of peculiar value.

Manufactories, moreover, in the territory referred to, are constantly springing up or enlarging, and calling for larger supplies of coal in consequence. The single town of Saint Johnsbury consumes 5,000 tons yearly, including the Fairbanks scale-works, all of which will come in by Maquam and the Portland and Ogdensburgh Railroad.

The Saint Albans Iron-Works alone will use 30,000 tons per year, and the town 8,000 more, which will reach the yards via Maquam Harbor and the Vermont Central Railroad.

The town of Swanton consumes about a thousand tons of coal per annum. Cheaper fuel will stimulate industries in the great territory in question, and enlarge the resources of the communities in occupation thereof.

IRON.

The supply of iron to the same area of country will be drawn through Maquam port and the lines of rails thence radiating. This will be true whether the stock be of

home or foreign manufacture, whether New York or Montreal be the market in which it is purchased.

The Fairbanks scale-works, at Saint Johnsbury will transport by this route the greater portion of the 7,000 tons of home and foreign iron annually consumed by them. The Saint Albans works will use the same route for their yearly consumption of 3,000 tons.

Until within a few years, charcoal-blast iron has been produced at Swanton, Vermont, in close proximity to Maquam Bay. The Portland and Ogdensburgh Railroad opens districts in Vermont where fuel is procurable at \$2.50 per cord, so that this branch of manufacture could probably be re-established for the production of fine qualities of iron, at least to some extent. The Lake Champlain ores turn out an excellent quality of iron.

SALT, PLASTER, ETC.

The salt of Liverpool and Syracuse, whether by way of Quebec or New York, will find its way by Maquam port into the territory referred to. The amount is large, embracing supplies for cattle and live stock, for dairying, pickling meats, domestic uses, &c.

Plaster will likewise come the same way, which already is used quite largely, and will be extensively for the renovation of grass-lands in the district in question. The town of Swanton alone uses 100 tons yearly. There is a great quantity of hemlock-lumber on the Portland and Ogdensburgh Railroad, which affords means for tanning on a great scale. Whether the hides are brought in, or the bark carried out, an important business from this source is anticipated; large tanneries are already in operation on this road.

EXPORTS.

Among the heavy, bulky articles that will find their way to market by water from Maquam Bay is lime. Quarries of this, of the finest possible quality, are situated in the town of Swanton, near the port. Some sixty thousand barrels are burned yearly. The product will be indefinitely increased, with lake transportation furnished close at hand. One concern received orders for 20,000 barrels over its ability to supply this season.

Marbles are manufactured largely in Swanton, the raw material being derived in part from islands in Lake Champlain, and in part from quarries in the town. Floor-tiles are turned out in large amount, as also table-tops, panels, fire-places, and other ornamental manufactures of marble. These productions can be profitably quadrupled if lake transportation can be secured. The tiles are used extensively in custom-houses, in the Department buildings at Washington, in banks, hotels, and first-class dwelling-houses, in all parts of the country.

On the line of the Portland and Ogdensburgh Railroad are two or three mines of soap-stone, which have been worked considerably, notwithstanding their distance hitherto from railroads; these could find cheap transportation, via Maquam, to market. The same holds true of a valuable hone-stone upon the same railroad, of an excellent quality, and already quite largely used. Also, a deposit of ocher; of one copper-mine, worked sufficiently to demonstrate its abundance and excellence, but hitherto far removed from facilities of transportation. The granite of Hardwick, on the same railroad, is one of the most beautiful building-stones in the world. There will be a considerable export of potatoes by barge from the harbor proposed, and more or less of other bulky agricultural products.

PASSENGER BUSINESS.

One hundred thousand passengers are moved yearly on Lake Champlain by a single line of steamers. To these, and to the tourists and pleasure travelers from Saratoga and Lake George, a route shorter by seventy miles than any now existing would be opened to northern Vermont and New Hampshire, to Mount Mansfield, and the White Hills, by a harbor at Maquam, enabling steamers to make regular calls and to make regular connections with railroad-trains at that point.

CAUGHNAWAGA CANAL.

Should this short cut of twenty-nine and one-half miles length and 25 feet lockage be made from the Saint Lawrence to Lake Champlain, propellers of nine hundred tons capacity could, upon the enlargement of the Welland Canal, now in progress, pass from Chicago, Duluth, and other lake ports, into Lake Champlain, and break bulk at Maquam docks, two hundred and twenty-six miles from tide-water. This is not advanced as a formal argument in the discussion, but only as an incidental consideration.

The canal will unquestionably be constructed, but, perhaps, not for some years, and, so far as regards the business to be derived from it, delay could be without detriment made in harbor improvements on Lake Champlain. When constructed, every line of rail leading from the lake to tide-waters will need the most ample port accommodations to transact the business that will be offering.

MISCELLANEOUS CONSIDERATIONS.

Maquam is an old port. More or less lake business has been done here for many years, notwithstanding the deficiency of proper facilities. Thirty-five years ago, indeed, a wharf was built to accommodate the traffic that was attracted to the port by its convenience to the back country, the good depth of water, &c. This during the past season has been re-established, steamers have begun to make calls thereat, and so soon as the harbor is properly protected a line of first-class lake steamboats will ply forth and back betwixt Maquam and other lake ports, arrangements to this effect having been completed with a company of ample means.

The concentration of railroads at this point, already effected, and to be speedily enlarged, as before specified, has increased indefinitely the value of the harbor as a convenient point of transfer from water to rail and rail to water, for a great extent of country. Upon these facilities, the outgrowth of a recent time, the argument for the appropriation by Congress is, to an important extent, vested. These, so widely extended in their scope, preclude the objection that the improvement is merely local or State interest, for, even as matters now stand, the business concerned is not merely inter-State but international.

The appropriation sought is not of doubtful character. The policy of harbor improvements on inland waters has become fixed in the traditions and practice of the Government. Nothing more is asked for Maquam Bay than was, many years ago, done for Burlington Bay. If the sum is granted, the total expenditure made by the Government on account of navigation on the coast of Vermont will foot up thousands, against millions of dollars for other single New England States.

Vermont regards this harbor one of her valuable resources, so to speak, from the improvement of which Maine and New Hampshire likewise will receive material advantage to their railroads and business.

Vermont desires only that the General Government will do for her in small measure what it has done in overflowing measure for other States, and what properly belongs to it to do in virtue of its jurisdiction over the waters of Lake Champlain. For the rest, private and corporate capital and enterprise will be responsible; will construct all required wharves, docks, and store-houses; will furnish all necessary equipments for the transaction of a large business; and will see to it that, for every dollar of the nation's money spent there, the nation shall be enriched tenfold.

All of which is respectfully submitted.

J. GREGORY SMITH.	HORACE FAIRBANKS.
FRANKLIN FAIRBANKS.	WORTHINGTON C. SMITH.
LUKE P. POLAND.	WALDO BRIGHAM.
A. B. JEWETT.	J. D. BELL.
WM. B. HATCH.	GEO. W. HENDEE.
ORANGE BUCK.	R. S. READ.
D. D. WEAD.	O. S. REXFORD.
CALVIN MORRILL.	JONATHAN ROSE.
J. H. GEORGE.	J. W. HARTSHORN.
S. S. GOULD.	E. C. REDINGTON.
S. J. ANDERSON.	W. L. PUTNAM.
RENSALEAR CRAM.	FRED. G. MESSER.
W. E. DONNEL.	H. N. JOSE.
J. B. BROWN.	J. S. WINSLOW.

Representing, in addition to various manufacturing, agricultural, and miscellaneous interests, the following transportation companies: The Vermont Central, Vermont and Canada, Rutland and Burlington, Lamoille Valley, Montpelier and Saint Johnsbury, Essex County, Portland and Ogdensburgh, and other railroads.

We, the undersigned, hereby certify that we are, and for many years have been, residents of the towns of Swanton and Saint Albans, in the county of Franklin and State of Vermont; that we are and have been well acquainted with the business of said town of Swanton for a number of years last past, and with its facilities for business, and we verily believe that the statements hereinbefore made are in accordance with the facts, and that the projects hereinbefore set forth will be carried forward to completion.

A. B. JEWETT.
GEORGE M. HALL.
HENRY A. BURT.
BRADLEY BARLOW.

STATE OF VERMONT, *Franklin County, ss :*

At Swanton, in said county, this 24th day of December, A. D. 1872, personally appeared A. B. Jewett, G. M. Hall, and H. A. Burt; residents of Swanton, and made oath that the foregoing statements by them subscribed are true according to their best knowledge, information, and belief.

THEODORE B. MARVIN,
Justice of the Peace.

STATE OF VERMONT, *Franklin County, ss :*

At Saint Albans, in said county, this 24th day of December, A. D. 1872, personally appeared Bradley Barlow and made oath that the foregoing certificate and statement by him subscribed are true according to the best of his knowledge, information, and belief.

J. RAND,
Master in Chancery.

III.—KEYPORT HARBOR, NEW JERSEY.

UNITED STATES ENGINEER OFFICE,
New York, January 18, 1873.

GENERAL: I have respectfully to forward a report and chart of Keyport Harbor, New Jersey, in compliance with the provisions of the act of Congress approved June 10, 1872.

Through Keyport Harbor many of the products of the rich farms of the townships of Raritan, Mattawan, Marlborough, Holmdel, South Amboy, Middletown, and Atlantic find their way to market.

The survey of Keyport Harbor embraces, besides the topography of the shores, the hydrography to the 9-foot curve. Borings were likewise made to establish the character of the bottom.

The bed of the harbor in and near the main channel consists of clay and fine sand. The maximum velocity of the tidal current is 0.50 knots per hour, which is inadequate to affect the stability of the river-bottom.

The channel has already been improved, as I am informed, by dredging, six years ago, to a depth of 6 feet at mean low water, and but slight filling of the channel since the dredging is now perceptible.

The draught of the larger vessels frequenting the harbor being 6 feet, and the fall of the lowest tide observed below mean low water being 1.3 feet, the improvement of the channel would require a depth of 8 feet at mean low water to be obtained and kept.

The harbor is protected, by its conformation, from easterly winds, but is exposed to the waves in northerly gales; the distance, however, to Staten Island not being sufficient, it is thought, to form waves of height sufficient to act upon the bottom.

An improvement by dredging would probably be permanent, or would benefit commerce for a long period.

I transmit herewith a tabular statement of vessels engaged in the commerce of this port, and of the value of the cargoes transported.

The survey was made by Messrs. A. Zoller and A. Doerflinger; the plotting by Mr. Charles L. Meyer, all under the direction of Mr. Julius H. Striedinger, civil engineer.

Estimate.

Dredging a channel 200 feet wide, about 4,700 feet long, to a depth of 8 feet below mean low water:

53,000 cubic yards of clay and fine sand, at 50 cents	\$26,500
Engineering, including buoying out of improved channel, and contingencies,	
15 per cent. of the above	3,975
Total	<u>30,475</u>

Keyport Harbor is situated in the Perth Amboy collection district.
Respectfully submitted.

JOHN NEWTON,
Lieutenant-Colonel Engineers, Brevet Major-General.

Brigadier-General A. A. HUMPHREYS,
Chief of Engineers, Washington, D. C.

Statement of vessels engaged in commerce of Keyport, New Jersey.

Name of steamer.	Name of captain.	Draught.	Tonnage.	Value of produce from Keyport to New York.	Freight from New York to Keyport.	Number of passengers.	Total amount.
Mattawan	H. E. Bishop.....	5 feet	774	\$520, 000	\$200, 000	120,000 fares, at 30 cents, \$36,000.	\$756, 000
Holmdel	James G. Taylor.	7 feet	500	805, 000	175, 000	20,000 fares, at 30 cents, \$6,000.	986, 000
S. S. Wycopff	C. E. Kipp	6 feet	200	260, 000	60, 000	.....	320, 000
Sarah Brown	J. Strong	6 feet	200	265, 000	45, 000	.....	310, 000
Schooners loaded with brick.	.....	.....	.....	.....	.....	.....	200, 000
Vessels loaded with oysters and clams.	.....	.....	.....	.....	.....	.....	360, 000
Annual value.	.....	.....	.....	.....	.....	.....	2, 932, 000*

* Not including value of vessels.

NOTE.—Twenty vessels daily cross the bar.

A. T. DRAKE,
United States Navy.

IV.—SURVEY OF THE DELAWARE RIVER BETWEEN TRENTON, NEW JERSEY, AND EASTON, PENNSYLVANIA.

UNITED STATES ENGINEER OFFICE,
Philadelphia, Pennsylvania, January 27, 1873.

GENERAL: I have the honor to forward herewith the papers relating to the survey of "the Delaware River between Trenton and Easton." They consist of the detailed report of the engineer in charge of the survey, Mr. M. Merriman, and an estimate of the probable cost of the improvements proposed, inclosed herewith, and of eight sheets of maps of the river, inclosed in a tin case and transmitted by express. These papers are so full and complete that the subject requires very few words from me.

Mr. Merriman's report presents fully the history, character, and condition of the river between Easton and Trenton; the history and extent of the lumber business upon it; the improvements heretofore made by State appropriations and personal efforts; the legislation of Pennsylvania and New Jersey, through a series of years; the jurisdiction exercised by the States over the river, and the questions arising between the several interests concerned in the waters and along the shores of the river. The map and charts afford abundant information respecting the position and character of the existing difficulties, and the remedies proposed.

The information embodied in these papers is more than the funds available for the survey could have afforded, without aid from other

sources. This has been largely and courteously supplied by a number of gentlemen living along the river shores, from Easton to Philadelphia. The United States are indebted in this respect to Mr. A. Mitchell, secretary Lehigh Coal and Navigation Company; Mr. J. A. Anderson, superintendent Belvidere Delaware Railroad; Mr. Ashbel Welch, chief engineer Pennsylvania Railroad, and to others, to whom Mr. Merriman refers in his report.

Very little interest was found to exist in the region of the survey in its objects. Some of the raftsmen manifested some interest in the improvements of the navigation. Captain L. B. La Barre, one of the most experienced river men, was an exception to the general rule. He visited Philadelphia, when the work was about commencing, gave abundant information, and was the pilot of the survey during the continuance of the field operations. He is regarded on the river as among the most skillful and intelligent persons engaged in rafting. This survey was provided for by "An act making appropriations for the repair, preservation, and completion of certain public works on rivers and harbors, and for other purposes," (general nature 134,) approved June 10, 1872, and was placed in my charge by your instructions June 19, 1872.

The expenditures on the work have been—

For field-work, materials, &c.	\$416 75
For field-work services	1, 325 00
For office-work	918 29
Contingencies	78 20
Total cost of survey	<u>2, 738 24</u>

Very respectfully, your obedient servant,

J. D. KURTZ,
Lieutenant-Colonel of Engineers.

Brigadier-General A. A. HUMPHREYS,
Chief of Engineers United States Army, Washington, D. C.

UNITED STATES ENGINEER OFFICE,
1328 Chestnut Street, Philadelphia, Pennsylvania, January 2, 1873.

SIR: Agreeably to your instructions of August 5, 1872, I proceeded at once to Easton, Pennsylvania, and began the survey of the Delaware River between that place and Trenton, New Jersey. My party consisted of Mr. F. F. Weld, assistant engineer, and Captain L. B. La Barre, a thoroughly informed steersman, who acted as pilot; a recorder, and two boatmen. We proceeded down the river, making detailed surveys of the falls and rapids, where obstructions to navigation existed, and reconnaissances of the remaining rapids, with the intervening reaches of the river.

Our work at times was rendered difficult and unsatisfactory by the high stage of water which prevailed, and accordingly, after finishing the examinations at Trenton, we returned to Easton on October 7, and were enabled, by running over the river again, to collect much information previously neglected. The field-work being thus finished in the space of little more than two months, Mr. Weld and myself returned to Philadelphia on October 16, and began the preparation of the maps and estimates. I now have the honor to present to you my report, giving in detail the information I have been able to collect concerning the regimen and navigation of the river, and proposing a scheme for its improvement, with an estimate of its probable cost.

Although my survey of the Delaware River was confined to that portion between Easton and Trenton, yet it seems necessary, in order to form a clear idea of the navigation between those places, that I should give here a short sketch of the river as a whole, or at least of that portion of it lying above tide-water at Trenton.

The Delaware River has its sources in Greene, Schoharie, and Delaware Counties, New York. The main or Mohawk branch has its origin in a small lake near the border of Schoharie County, at an elevation of 1,886 feet above the sea-level.* Following

* McCullough's Geographical Dictionary, vol. 1, p. 739.

the devious windings of the river, the distance to tide at Trenton is about two hundred and thirty miles, and the average fall per mile 8.2 feet. The main branch runs, at first, southwest fifty miles to the line of Broome County, within ten miles of the Susquehanna River, then suddenly turning to the southeast meets twelve miles below the east branch, or Popacton, which rising fifty miles to the northeast runs nearly parallel to the first. From the junction of the two the river proceeds sixty miles in a winding course, receiving from the right the Lackawaxen, and from the left the Neversink Creek. At its junction with the Neversink at Carpenter's Point, it turns to the southwest along the base of the Kittatinny Mountains about thirty-five miles until it passes by the breach called the Delaware Water-Gap; then southerly thirty miles, receiving at Easton the Lehigh from the right, and a few miles below the Musconetcong from the left, until it there passes the gap in the South Mountains; then pursuing a southeast course for fifty miles, it again, at Bordentown, changes its direction and runs onward through the Delaware Bay to the ocean.

The length of the entire river is usually given at three hundred or three hundred and ten miles, and its drainage area at eleven thousand two hundred and fifty square miles.* I have made a computation of the drainage area above Trenton and find it to be six thousand nine hundred and fifty square miles. Assuming the rain-fall and evaporation over both these areas to be the same, it appears that three-fifths of the entire discharge of the river comes from the region lying above tide-water at Trenton.

A sketch of the river system of the Delaware, which I present in Appendix A, p. 38, shows at a glance the drainage area above Trenton, and exhibits the relative rise and importance of its numerous tributaries. It will also be of service when I come to treat of the lumber trade and navigation of the river.

The general topographical features of the Delaware have been so well described by Professor Rogers† that I cannot do better than give here his own words:

"This noble river exhibits along its immediate valley a considerable variety of topographical feature and scenery. From its head streams in New York to where it emerges from the Pokono or Catskill Mountains it flows in a tortuous course through a deep trough in that elevated table-land. The mean level of the plateau remaining constant and the valley growing progressively deeper; the river-hills grow higher and higher as it descends. Meandering much more than the valley containing it, the river sweeps sometimes close by the base of the bounding hills, the lower part of which are, in many cases, faced by high, naked cliffs, exposing the red, brownish shales of sandstones of the district. The perspective of jutting and retreating hills, clothed with a combination of coniferous and deciduous forest to their summits, and washed at their base by long, bending reaches of the broad river, is very attractive, notwithstanding a prevailing sameness in general feature. After leaving the plateau in Pike and Wayne Counties the river emerges into a broad, open valley wholly different in structure and aspect from that which it has left. The waters which carved a way for it seem to have been impelled in their momentum southward with great energy against the strong, stony barrier of the Kittatinny or Shawangunk Mountain, and to have scooped their deepest trench near the base of that high ridge. The river, therefore, turns abruptly near Carpenter's Point from a southeast to a southwest course and follows that of the mountain, sometimes hugging its base, sometimes sweeping a moderate distance from it into the plain, until it finds a passage through it at the great breach called the Delaware Water-Gap. The scenery along this stretch of the river is eminently beautiful. Low within the valley the river is bordered by cultivated flats, variously carved in one or more terraces, and behind these, particularly on the northwest, rise numerous rolling hills, some under the plow, some covered with timber, all deeply cut by ravines, while still beyond the hills we see ascending the long slopes or bold escarpments of the plateau of the Upper Delaware. All the way along on our left the view is bounded by the forest-covered flank and straight crest of the Kittatinny Mountain. Turning at the Water-Gap, the river, in issuing through the main ridge of the mountain, passes between nearly perpendicular mural-cliffs of gray sandstone rising on either side to its crest.

"Leaving the Water-Gap, the river descends gently southward, obliquely across the entire breadth of the Appalachian plain to where it enters the hills called the 'South Mountains' below Easton. This portion of its course is marked by no striking features, the surface of the country being elevated only 100 to 200 feet above it, and being, from the softness of the slates or limestones, smoothed down into rather inexpressive lines.

"Below the mouth of the Lehigh, the Delaware is bordered by an alternation of hills and narrow, intervening valleys, the river-hills being but the ends of the intersected ridge of the chain of the Highlands of New Jersey. But from the southern edge of these hills, at Durham, the scenery for many miles southward wears a wholly different character. It is that of a table-land, elevated 300 to 400 feet above the level of the river, cut, on one or both sides of the valley, into long ranges of perpendicular cliffs, or excessively steep slopes. One range of precipice on the Pennsylvania side, known as the

* Baldwin's Gazetteer of United States, p. 315.

† Rogers's Geology of Pennsylvania, vol. 1, p. 47.

Nockamixen Rocks, is an exceedingly striking and picturesque range of beetling cliffs, rising sheer, for 200 feet, from the brink of the river, with only a narrow roadway and canal between them, through a length of nearly three miles. Some of the views from the base of these carps are almost grand, and the pictures they make, with the river below, are beautiful.

"Farther down the valley the Delaware passes, near New Hope, some bold sides of trap rock, which impart a pleasing variety to its banks, elsewhere in this part of its course comparatively tame. Passing Trenton, its borders presently put on a totally changed aspect, ceasing to be a gay, running stream; full of bushy islands, and rocky reefs, and rapids, it becomes a wide, tidal river, rising and ebbing between shores which are, in many places, only low banks of sand and gravel, and in others broad marshes, covered with reeds and grass. Turning, at Bordentown, southwestward, the river maintains these features all the way to its wide estuary, the Delaware Bay."

The only navigation at present upon the Delaware River, above Trenton, is that of the rafts which come down during the spring and fall floods. Previous, however, to the construction of canals and railroads, the river, although difficult to navigate, was an important highway of commerce. The boats first used appear to have been narrow, flat-bottomed scows, from 25 to 40 feet in length, which were allowed to float down with the current, and on their return up were propelled by poles. About the year 1750 "Durham" boats were introduced, so called from having been first built at Durham Village, ten miles below Easton.

These were round-bottomed boats, pointed at both stern and bow, about 60 feet long, 10 wide, and 5 deep, with a low cabin for sleeping apartment, and one aft for provisions; the center of the boat was thus left free for the load. The crew consisted of three men, two with long setting-poles, and one at the rudder, who also used a shorter pole. When fully loaded they drew about 30 inches; the usual load on the down trip being 20 tons, on the up trip 5 to 10 tons. The time usually required for a trip from Easton to Trenton was one day, while the return trip ordinarily occupied three days. About 1810 coal began to be carried down the river in "arks," which were simply rectangular pine boxes usually hinged in the middle like canal-boats, and being from 50 to 80 feet long and 16 wide, and drawing 2 feet of water. These were furnished with oars for use on the reaches of the river between rapids. On arriving at the market in Philadelphia, after discharging their cargoes, the arks were taken apart, the lumber sold, while the iron-work was carried back across the country to the Lehigh to be used again in the construction of others. The Delaware division of the Pennsylvania Canal, finished in 1830 from Easton to Bristol, caused both Durham boats and arks to be but little used after that time. It is proper to mention here that the river was navigated by Durham boats as far as Lackawaxen Creek, seventy-five miles above Easton, and probably much farther.

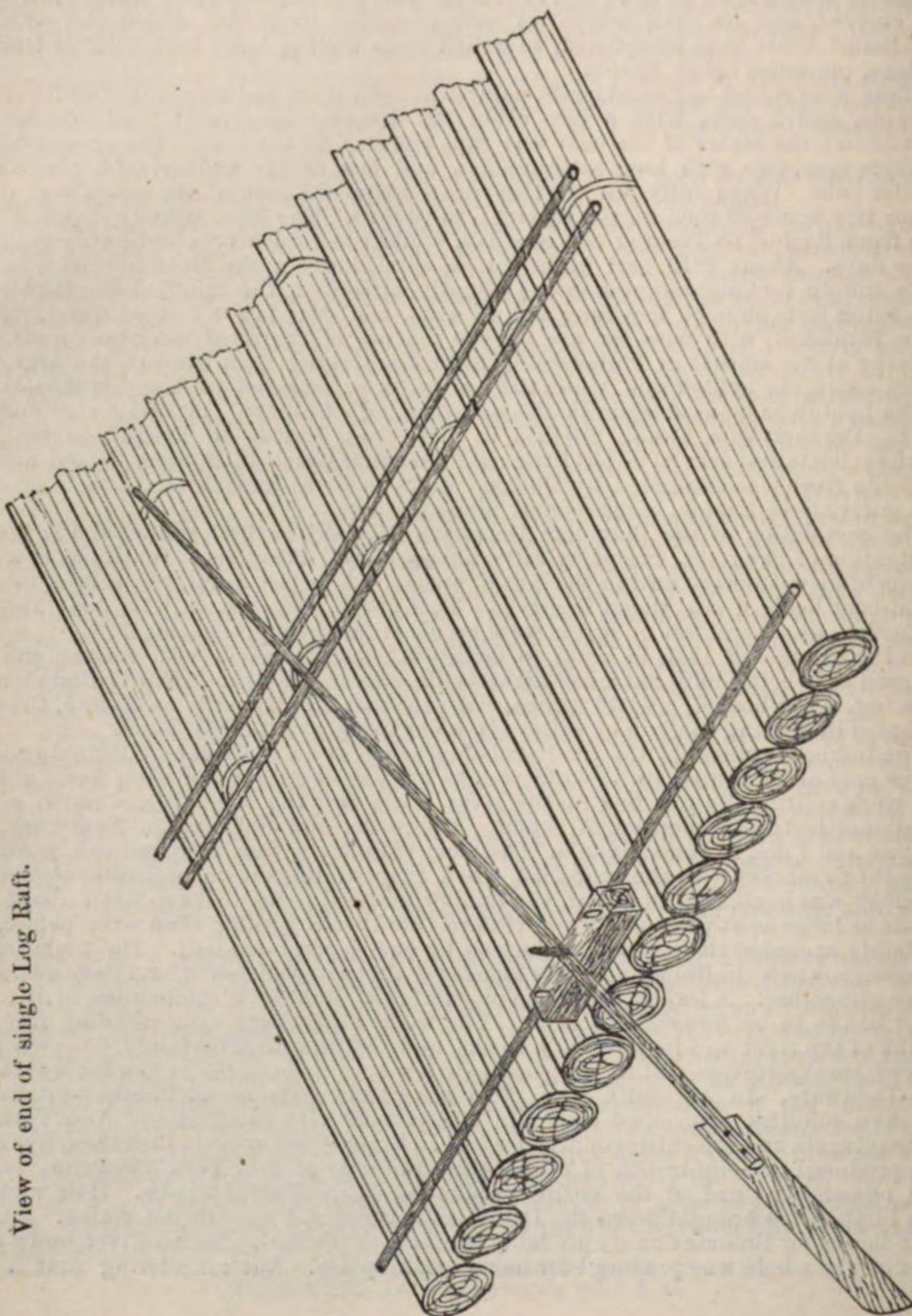
The completion of the Belvidere Delaware Railroad, in 1857, rendered any further navigation of the river, except by rafts, unnecessary. Previous to that time, however, it was often customary during the winter season, while the canal was closed, to send canal-boat loads of coal down the river. This could, however, only be done at times of freshet, as several feet of water were required for their safe passage.

In the summer of 1851, in order to facilitate communication with Easton, and the railroad only being built as far as Lambertville, a steamboat, the Major William Barnet, drawing, when loaded, only 18 inches, was run from Lambertville to Easton, the time occupied in making the trip of thirty-six miles being about eight hours.

The lumber business of the river probably began at an early date. Beginning at the lower part of its course, its inclosing banks have been stripped of their forest growth, the work continually receding up the river, until now the lumber production is confined mostly to the counties of Broome, Delaware, and Sullivan, in New York, and Wayne and Pike, in Pennsylvania. The most valuable woods, pine and oak, were first brought to market. In the year 1824, when these timbers were becoming scarce and hemlock was beginning to be cut, the lumber trade appears to have been about two-thirds as large as at present. From 1835 to 1850 it was greater than ever before, and probably exceeded the present production by one-third or one-half. The trade on the Delaware is now declining, and it is estimated that in twenty-five or thirty years will cease altogether. A large item in the marketing of lumber is the hauling of it to the river banks to be formed into rafts. The forests are every year receding from the banks of the river and its tributary creeks, and the time must certainly come when the cost of transportation will be too great to allow it to be brought to market by way of the Delaware. In Appendix B, p. 39, I have shown the *sawed* lumber statistics of the five counties mentioned above, in comparison with the States of New York and Pennsylvania and the entire country for 1860. From this it appears that these five counties produced one-eighteenth of all the sawed lumber of New York and Pennsylvania, and one-eighty-third of the entire production of the United States. How much of this lumber was brought down the Delaware River is not easy to determine. Part of that shown for Broome County probably went down the Susquehanna River, and a small part of the whole was produced for home consumption. But considering that a con-

siderable amount also went down the Delaware from Ulster and Orange Counties, New York, it seems fair to assume that the amount represented by these figures was actually floated to market by way of the river. Assuming, then, \$1,115,983 to be the value of the sawed lumber in 1860, and that an equal number of feet of logs was also rafted, their value from this table being \$499,215, the entire value of sawed lumber and logs becomes \$1,615,198, which, by the addition of wharf timber, piling, &c., might be raised to \$1,800,000; the average value per thousand feet, board measure, being about \$12. The amount of lumber then rafted would appear to be 150,000,000 feet.

The information which I have collected concerning the present trade upon the river shows that it is larger than represented above. The average annual number of rafts at present run to points below Trenton appears to be 3,000, of 60,000 feet board measure. This gives 210,000,000 feet, which, at \$12 per thousand, would be \$2,520,000. Of this number of rafts, 1,500 are of sawed lumber, 1,200 logs, and 800 of wharf timber, piling, &c. In Appendix B, page 39, I present an approximate statement of the business of the saw-mills at and below Easton, from which it appears that 113,700,000 feet of lumber are annually produced from logs brought from the upper waters of the Delaware.



View of end of single Log Raft.

The timber is principally hemlock; occasionally a raft is composed of ash, basswood, and hard maple, but they are rare. The timber for piles is also in part white pine. It is cut mostly in the months of May and June, drawn to the river-banks, and rafted during the next winter and floated to market by the following spring-floods. The logs are cut in lengths from 12 to 40 feet. The logs of 12 feet in length are placed with those of 18 feet and 24 feet to form a raft, being arranged alternately to break joints. In the same way those of 14, 21, and 28 are placed together, and so on, until we find them composed of lengths of 28, 42, and 56 feet, and of 30, 45, and 60 feet. The average diameter of the logs is 20 inches. Many logs are 3 feet in diameter, and occasionally those of 4 feet are seen. The ordinary width of a log-raft is 24 feet, very rarely exceeding 30 feet. In length the rafts vary from 150 feet to 200 feet. At the ends of each length of 16, 18, or 20 feet, as the case may be, are placed across the raft small poles of three or four inches diameter, to which each log is secured by means of pins and bows. Being then furnished at each end with a long sweep or oar, the raft is ready for its journey down the river. After emerging from the creeks at the upper part of the river into sufficient width of water, two of the single rafts described above are lashed together and form what is called a double raft, from 40 to 60 feet wide. An additional oar is often placed at the hind end, so that the crew for a single raft consists of two men, for a double one of four or five men. The steersman stands at the back, right-hand, or Pennsylvania oar, from the head of the river to Upper Black's Eddy, (fifteen miles below Easton,) where he changes to the Jersey oar for the remainder of the trip.

The rafts of the sawed lumber are usually of the same length as the log ones, but of a less width, varying from 18 to 22 feet. The rafts composed of wharf and pile timber, or "toggle timber rafts," are bound together in the same way as the log ones, and in addition are often loaded with sawed lumber. The depth of water required for the safe passage of rafts is from 8 inches to 30 inches, and in rare cases perhaps 3 feet.

The principal lumber depots on the upper Delaware are Delhi and Deposit, on the Mohawk Branch, Walcott, on the East Branch, Hancock, at the junction of the two branches, and Calicoon and Cochocton, twenty-five miles below Hancock. The time required to bring a raft from these points to Easton, varies with the height of the water and the direction and force of the wind. In ordinary rafting freshets of 5 to 10 feet, however, the time appears to be from Delhi to Easton, 165 miles, 40 to 48 hours; from Walcott to Easton, 165 miles, 40 to 48 hours; from Hancock to Easton, 125 miles, 30 to 36 hours; from Calicoon to Easton, 100 miles, 24 to 30 hours; from Easton to Trenton the time is from 10 to 12 hours; so that the entire trip from Walcott or Delhi to tide-water is performed in from 50 to 60 hours, showing the mean velocity to be from 4.3 to 3.6 miles per hour.

Concerning the floods or freshets of the river I have been unable to collect very exact statistics, particularly of those during the last few years. Their times of occurrence seem to be quite irregular, as well as the heights to which they rise. In general it may be said that the river is subject to three classes of floods: the ice-floods, which happen at the breaking up of the river; the rafting-floods, occurring later, from the spring rains; and the fall-floods, caused by the storms of September and October, which, however, are very irregular. The heights of these floods I have only been able to ascertain for Easton and points below; at places above they are known to be similar in their character and occasionally to produce very disastrous effects.

The ice-floods are usually, at Easton, 10 to 20 feet in height, but on many occasions have been known to rise much higher, the "great flood" of 1841 having reached 35 feet. The great accumulation of water here is owing to the influx of the Lehigh, a very turbulent stream in time of freshet, and to the narrow steep banks between which the Delaware is confined; its width being less than 600 feet. The following description* of the effects of the flood of 1841 may perhaps here not be inappropriate:

"It becomes our painful duty to record a scene of destruction and desolation such as never before was witnessed in this section of the country. The late excessive rain, carrying with it the snow which had covered the ground, caused our streams to rise beyond all precedent. On the morning of the 8th instant they came tearing down with awful rapidity, producing waste and ruin on every side, bearing on their angry waters every kind of property, houses, barns, store-houses, fences, stacks of grain, and furniture of all description. The Lehigh River, one of the most unruly of streams, has caused the greatest damage. As far as heard from, not a bridge is left spanned across it. The beautiful bridge here went about 4 o'clock on the morning of the 8th instant. The flats below South Easton, containing the collector's office of the Lehigh Coal Navigation Company, and a small village, were completely inundated, so as to hide the dwellings; all but a store-house was carried off. The lower part of Williamsport is almost destroyed, and both sides of the river here present but one scene of ruin. The Delaware, so remarkable for its mildness as to be called 'the silvery Delaware,' also assumed a new character. It was estimated that it was 35 feet above low water, 6

* Easton Whig and Journal, January, 1841, quoted by Rapp, Hist. Northampton County, p. 53.

feet higher than ever was heard of before. The destruction of the bridge across it was looked for during the whole of the 8th, but it stood the flood, although much injured and torn. Report has it that below this every other bridge on the Delaware is gone. The State works along the Delaware and the Lehigh Company's improvements are damaged to a great extent. At many places no traces of the canal are left, the current having swept the banks away to low-water mark for great distances, and all along the line they are more or less injured."

At Bull's Island this flood appears to have risen 23 feet, at Lambertville 20 feet, and everywhere to have caused very much damage. For ten miles above Trenton the river becomes much wider, and its banks less steep, so that floods are rarely more than 10 or 12 feet. On one occasion, when the ice became jammed at Perriwig Island, causing a blockade, the water was known to rise about 15 feet at Trenton.

The rafting freshets in the spring are of less rise, but of longer duration than the ice-floods; at Easton ranging from 3 to 10 feet, at Lambertville 1 to 8 feet, and at Trenton 1 to 6 feet. A very remarkable rise, however, occurred on June 8, 1862, which was 32 feet at Easton, and, next to that of 1841, the greatest flood on record.

The fall-floods, which are also employed by the lumbermen in sending their timber to market, are irregular in their occurrence and the stage to which they rise. Several seasons have been known in which no floods occurred at this time, while in others, as in 1845 and 1869, they were very great. The following is a partial list of the "great floods," with the heights to which they rose, as nearly as can now be ascertained.

Name of flood.	Date of occurrence.	Height to which it rose above low water.
Pumpkin fresh	October 6, 1786	16 feet at Lambertville.
	1798	Not as high as last, but exact height not known.
Jefferson fresh	1801	14 feet at Lambertville.
	1814	14 feet at Lambertville.
	March, 1832	12 feet at Lambertville.
	April, 1836	14 feet 5 inches at Lambertville.
	April, 1839	14 feet 5 inches at Lambertville.
Great flood	January 8, 1841	35 feet at Easton, 23 feet at Bull's Island, 20 feet at Lambertville, 28 feet at Lamsin's Island.
	October 13, 1843	14 feet at Lambertville.
	March 15, 1846	17 feet 5 inches at Lambertville.
June fresh	June 8, 1862	32 feet at Easton.
October fresh	October, 1869	Exact height not known.

The point which has been particularly forced upon my attention, in connection with this subject, is the great frequency with which floods now occur as compared with the time previous to 1835. While the preceding table is supposed to contain the record of every "great freshet" previous to 1841; it by no means shows those occurring since that date. In fact, they have become too common to be a matter of record. Previous to 1835, floods of 12 feet at Lambertville were considered very high, while 14 feet had been attained only three times within the memory of man, in 1786, 1801, and 1814. But since that time floods of 14 feet have become common, while three have occurred—1841, 1846, 1862—in which probably one-third to one-half more water has been discharged than in any previously known. This is undoubtedly to be attributed to the clearing away of the forests in the river basin, which previously exercised a protective action in restraining the percolation of the rain-fall through the soil and thus insuring to the river a more even flow of water than at present.

While the floods of the river rise higher than formerly, the stage of low water seems to have been becoming lower every year. The observation of the inhabitants appear to show that in times of low water the water of the river is fully 6 or 8 inches below the most unusual low stage of 40 years ago. That this should be true seems also manifest from induction. When the banks of the river were protected by the covering of a forest growth, the rain-fall would pass slowly through the soil and be restrained in its passage over the surface of the ground. The supply to the river would be furnished slowly, and extremes of neither high nor low water might be expected. But the forest has been removed, the soil in great part is under cultivation, and upon a downfall of rain the water quickly runs over the surface of the ground, causing a freshet in the river which often produces serious damage. Then if a dry season ensues the river is scantily supplied and its stage is very low. The summer and fall months are those in which the river is the lowest. (See Appendix C, p. 40.)

To recapitulate then this branch of my subject. I may say that the stage of the river throughout the year is ordinarily as follows: January, frozen and medium height;

February and March, breaking up and high; April, May, and June, high; July, subsiding; August and September, low; October, low but subject to high freshets; November, low—often very low; December, rising a little and freezing.

The above considerations show that the daily discharge of the river is an exceedingly variable quantity. An approximation to the average can, however, be made. I have computed that the area drained by the river *above* Easton is five thousand and twenty square miles, and by the river *below* Trenton, six thousand nine hundred and fifty square miles.

The average annual rain-fall, over this section of country, is 41 inches.* Experiments at the Schuylkill Navigation Reservoir, the nearest point to the area under consideration at which such observations appear to have been made, show that 50 per cent. of the rain-fall at that place is evaporation.† The evaporation will be much less in the Delaware Basin, however, situated as it is in a mountainous region, and its great slope permitting a quick and thorough drainage.‡ Assuming, therefore, the discharge to be 60 per cent. of the rain-fall, the average annual amount of water passing Easton, above the mouth of the Lehigh, is about 246,896,000,000 cubic feet; and passing Trenton, below the mouth of the Arrampink, 397,197,000,000 cubic feet, or 7,800 cubic feet and 12,600 cubic feet per second, respectively. On the 11th of September, when the river was about one foot above the low-water stage, I made a series of soundings and current observations at Wells's Falls, near Lambertville, which have enabled me to find the discharge at that time to be 2,900 cubic feet per second. Mr. Ashbel Welch, of Lambertville, chief engineer of the united railroads of New Jersey, informs me that at times of very low water he has made measurements which have given 2,000 cubic feet per second. The efflux, in times of great floods, is probably fifteen or twenty times as great.

The velocity of the river undergoes variations similar to the discharge. In times of low water it varies from zero in the pools to 9 or 10 feet per second in the swifter rapids. An average velocity seems to be about 2 or 3 feet per second, or from 1.5 to 2 miles per hour. When floods occur the river rises higher at the bottom than at the top of the rapid; it becomes "drowned out," as the raftsmen express it; and in high freshets the water has a nearly uniform slope and velocity through long distances of the river. I have already shown that in rafting freshets the velocity is about four miles per hour. In the great flood of 1841 a man named George D. Fell was carried away upon one of the bridges, and floated several miles down the stream before he was rescued. The time of this event was accurately noted, and it serves to determine that the velocity was twelve miles per hour, or 18 feet per second.

Having presented these general conclusions concerning the navigation and regimen of the Delaware River, I shall now confine myself to that portion lying between Easton and Trenton, and give first an account of its main features and the previous attempts to improve the navigation; afterward a more detailed description of the localities where the obstructions at present exist, and finally a plan and estimate for their improvement.

The following maps have been prepared and will be understood as continually referred to during the remainder of this report:

	Scale.
Sheet No. 1, a general map of the river between Easton and Trenton	31680
Sheet No. 2, map of Ground Hog and Rocky Falls	2400
Sheet No. 3, map of Penn Channel, at Ground Hog	600
Sheet No. 4, map of Tumble	2400
Sheet No. 5, map of Wells's Falls	2400
Sheet No. 6, map of Scudder's Falls	2400
Sheet No. 7, map of Gould's Rift	2400
Sheet No. 8, map of Trenton Falls	2400

The portion of the river embraced by the examination and surveys which I have made lies between the upper bridge, at Easton, and the lower bridge, at Trenton, a distance of forty-nine and a-half miles measured along the line of the river-channel. From Easton to a short distance below Lambertville the river valley is narrow, and its bounding hills often steep and precipitous. During the remainder of the distance to tide-water its banks are low, and it flows apparently in a broad rolling plain, in strong contrast to its previous winding and contracted course. (See Appendix D, p. 41.)

At Rocky Falls, seven miles below Easton, the river makes a sharp turn and breaks through the Pohatcong Mountain, a part of that chain of azoic or metaphoric rock which, running southwestwardly from the highlands of the Hudson, passes through New Jersey, crosses the Schuylkill, near Reading, and continues on in the same course through Pennsylvania and Maryland, under the name of the Blue Ridge. At Trenton Falls it is also crossed by another ridge of azoic rock, which, running nearly parallel

* Blodgett's Climatology of United States, pp. 317, 354.

† Humphreys's and Abbott's Report, Mississippi River, p. 280.

‡ *Idem*, p. 136.

with the first, is seen in New York City and Staten Island, and again on the Schuylkill, near Manayunk. Between these two chains of primitive rock is the red sandstone of the Triassic period, piled up against the northern ridge to great depths, and containing at many points dikes of trap-rock, which now lift themselves high above its surface. Passing then down the river, there is the following succession of rock: From Easton to Rocky Falls, the silurian limestone, which is piled up against the first primitive ridge. Then, from Rocky Falls to Durham, the azoic gneiss, interrupted however at Reigelsville by the limestone, which here borders the valley of the Musconetcong. From Durham to Trenton the triassic sandstone, interrupted at Point Pleasant, at Prallsville, and at Lambertville, by ridges of trap. At Trenton a very narrow belt of azoic gneiss occurs in the river-bed, and below this are the beds of the cretaceous formation.

A list of the heights of many of the hills along the river-banks, as also of other points of reference, is given in Appendix D, p. 41, while the details concerning the bridges are shown in a tabular form in Appendix E, p. 42.

With the exception of the Lehigh and Musconetcong, the creeks are small, and, except in times of freshet, discharge but little water. On the Jersey side, the Pohatcong, twenty-six miles long, drains one hundred and twenty-four square miles, and the Assanpink, twenty-one miles long, drains one hundred and five square miles.* On the Pennsylvania side are the Tinicum and Tobicon Creeks, of lesser size, with a few others still smaller. The soil being very red in color, and large quantities being brought down by these creeks in times of freshet, the water of the river then assumes a muddy-reddish appearance, and it is only during seasons of drought that it becomes perfectly clear and transparent.

The violent freshets which occur now almost annually have swept away from the banks of the river, and from the islands, which are so numerous, great areas of land. This has caused the river to increase in width but to decrease in depth, while the great quantity which has been carried down and deposited at tide-water, between Trenton and Bordentown, is producing great injury to important commercial interests. This action may be illustrated by a reference to Whippoorwill Island, two and one-half miles below Easton. Before the year 1841 it was much longer than at present, with steep banks rising fully fifteen feet above the stage of low water, and covered with a heavy growth of timber. The high flood of 1841 washed away from its upper end a small width of ground with its protecting trees, and each subsequent freshet continued to wear it slowly away. In 1862 all the trees were swept off, except a few at the lower end, and its height greatly reduced. In 1869 the destruction was completed by the removal of the remaining trees, and it is now a mere gravelly shoal, only in its highest point rising five feet above the low-water mark. The entire quantity of earth removed from this island since 1841 cannot be less than 8,000,000 cubic feet. All along the river-banks are seen places where this destruction is continually going on. I have gathered information concerning this action upon the islands and banks for the first six miles below Easton, from which I estimate that, since 1841, there have been annually carried away 70,000,000 cubic feet between Easton and Trenton. Mr. Welch, to whom I have already referred, has made estimates upon this subject which lead him to conclude that an ordinary freshet, such as would rise 10 feet at Lambertville, will sweep away 20,000,000 cubic feet, and that in the very high floods 100,000,000 cubic feet have been carried down.

As already remarked, a large percentage of this is undoubtedly deposited below Trenton. In illustration of this powerful transporting and abrading force of water, I may mention that, during the time of the ark navigation, a cargo of coal wrecked at Welle's Falls was by a single freshet, carried down to Larrison's Island, a distance of two miles, and that large pieces, weighing 100 pounds or more, were worn perfectly smooth and round in their journey.

Between Easton and Trenton there are thirty-one rapids, usually called rifts or falls, produced by contraction of the channel, or obstructions in the river-bed. These are enumerated in the following table, with the principal numerical facts concerning each which I have been able to collect during the limited time allotted to the survey:

*Cook's Geology of New Jersey, p. 26.

Falls and rifts on Delaware River between Easton and Trenton.	Distance from the upper bridge at Easton to the head of each rift.	Miles.	Distance from the rail-road bridge at Trenton to the head of each rift.	Miles.	Length of each rift.	Feet.	Time for boat to run through rift.	M. S.	Height of head of rift above low water at Trenton.	Feet.	Height of foot of rift above low water at Trenton.	Feet.	Fall of each rift.	Feet.	Depth of water at head of rift in time of low water.	Depth of water through rift in time of low water.	Character of bottom of rift.
1. Phillipsburgh Rift.....	0.2	49.3	3,900	6 30	156.70	150.85	5.85	1.0	1 to 4	Stones and gravel.							
2. Whippoorwill Rift.....	2.5	47.0	1,200	4 30	145.28	141.23	4.05	4.0	5.0	Do.							
3. Clifford's Rift.....	3.6	45.9	1,500	6 30	141.23	136.49	4.74	1.0	4 to 8	Do.							
4. Old Sow Rift.....	4.8	44.7	2,650	8 00	134.58	132.02	2.56	1.0	1 to 5	Do.							
5. Ground Hog Rift.....	6.0	43.5	2,000	7 00	128.98	127.78	3.04	2.0	2 to 12	Gravel, with rocks near shore.							
6. Rocky Falls.....	7.0	42.5	3,900	.....	126.73	123.57	1.20	5.0	4 to 7	Rocks.							
7. Gravelly Rift.....	7.8	41.7	800	.....	123.57	123.15	3.16	2.0	3 to 10	Gravel and stones.							
8. Durham Falls.....	9.2	40.3	500	.....	123.15	114.76	0.42	5.0	1 to 10	Do.							
9. Old Fry Rift.....	10.5	39.0	100	0 45	123.15	109.47	8.81	2.5	2 to 3	Do.							
10. Lynn's Falls.....	11.5	38.0	2,000	7 00	113.91	109.47	4.44	1.0	1 to 7	Gravel and rock.							
11. Noxamixon Falls.....	13.1	36.4	1,300	7 00	109.47	104.11	5.36	2.0	1.5 to 4	Gravel and stones.							
12. Ferman's Falls.....	16.5	33.0	1,000	6 30	104.11	102.61	1.50	1.0	1 to 4	Gravel and some boulders.							
13. Stuhl's Falls.....	17.7	31.8	600	3 30	102.61	101.61	1.00	3.5	3 to 5	Gravel and stones.							
14. Man-of-War's Rift.....	20.5	29.0	400	2 15	101.61	99.31	2.30	2.5	2 to 3	Do.							
15. Buttonwood Rift.....	21.1	28.4	700	4 00	99.31	90.79	8.52	2.5	2 to 3	Do.							
16. Little Howle's Rift.....	22.5	27.0	1,500	5 30	90.79	85.71	5.08	1.3	2 to 3	Do.							
17. Rush Rift.....	23.3	26.2	300	2 00	85.71	81.54	4.17	2.0	1 to 2	Ledges of rock.							
18. Wharford's Rift.....	24.0	25.5	2,700	.....	81.54	71.17	10.37	.....	1 to 5	Do.							
19. Little and Big Tumble Falls.....	24.7	24.8	4,600	.....	68.73	64.61	4.12	.....	2.5	Gravel.							
20. Bull's Falls.....	27.5	22.0	1,800	3 30	.....	.....	.....	.....	2 to 3	Do.							
21. Eagle Rift.....	29.9	19.6	1,500	5 00	.....	.....	.....	.....	3 to 4	Gravel and rock.							
22. Howell's Rift.....	30.7	18.8	2,000	4 30	.....	.....	.....	2.0	.....	Gravel.							
23. Bird's Point Rift.....	32.2	17.3	500	3 00	.....	.....	.....	.....	3.0	Gravel and rock.							
24. Limestone Rift.....	33.5	16.0	700	1 30	47.41	33.10	14.31	1.5	2 to 6	Rocks.							
25. Welle's Falls.....	35.8	13.7	4,100	8 00	.....	.....	.....	5.0	3 to 4	Gravel and stones.							
26. Bucktail Rift.....	37.2	12.3	400	2 50	.....	.....	.....	.....	2 to 3	Do.							
27. Beaumont Rift.....	38.2	11.3	150	1 15	.....	.....	.....	.....	.....	Do.							
28. Carr's Rift.....	40.5	9.0	300	.....	23.05	.....	.....	8.0	1 to 5	Do.							
29. Scudder's Falls.....	43.5	6.0	2,600	4 00	14.45	9.76	4.69	1.5	1.5 to 2.5	Rock and boulders.							
30. Gould's Rift.....	46.1	3.4	1,600	.....	7.57	0.0	7.57	2.5	1 to 3	Rock, boulders, and gravel.							
31. Trenton Falls.....	49.0	0.5	3,400	.....	.....	.....	.....	.....	.....	.....							

(*) 1.7 fall in first 500 feet.

In Appendix F, p. 43, I have given, for comparison with this table, a list of the rifts as ascertained by a survey which was made about the year 1827. These rifts may be considered as forming two classes: those with gravel bottoms and those with rocky bottoms; and, as will be seen hereafter, nearly all the difficulty in the navigation of the river is at those points where the rocky bottom occurs.

The entire fall of the river in the forty-nine and a half miles of the survey is, from the above table, 156.7 feet. Although this is not the result of a continuous line of levels, (the canal-level being used sometimes for long distances,) yet it is nearly correct, (see Appendix F, p. 43,) and gives the fall of each rift accurately. The mean fall then is 3.17 feet per mile. In many pools there is scarcely any fall for long distances, while the rapids have a quick descent, the greatest being in Welle's Falls, where in 4,100 feet the fall is 14.38 feet, or at the rate of $18\frac{1}{2}$ feet per mile. The velocity undergoes as great variations in the pools between Lambertville and Trenton, a raft often floating *up* stream under a slight southerly wind, while it runs through the swift rapids at the rate of six miles per hour. As mentioned before, the velocity varies with the stage of water also.

There are three stopping-places or eddies, where rafts halt for the night: Upper Black's Eddy, Lower Black's, and Titusville. Between these points the time and velocity of rafts vary with the stage of water and direction of wind, as follows, (of also p. 8, (2):) Croupe's Eddy, one mile above Easton, to Upper Black's Eddy, sixteen miles, two to five hours, velocity 8 to 3.2 miles per hour; Upper Black's, fifteen miles below Easton, to Lower Black's Eddy, twelve miles, two to four hours, velocity six to three miles per hour; Lower Black's, twenty-seven miles below Easton, to Trenton, (one mile below bridge,) twenty-three and a half miles, five to nine hours, velocity 4.6 to 2.5 miles per hour; Croupe's Eddy to Trenton, (one mile below bridge,) fifty-one and a half miles, nine to eighteen hours, velocity 5.7 to 2.9 miles per hour. From which it appears that the velocity decreases as the river descends or becomes wider.

In the year 1771 the legislature of Pennsylvania appointed twenty-six commissioners to receive subscriptions and to improve the navigation of the Delaware. I have been unable to ascertain whether, at that time, any improvements were made. In 1817, however, (Appendix G, p. 44,) the sum of \$10,000 was appropriated to improve the river from Trenton to a point about twelve miles above Easton, and three commissioners were authorized to undertake the work. With this money blasting was done at Rocky Falls, Tumble, and Welle's Falls, and wing-dams built at several places, which are now almost entirely swept away. Shortly after, the Lehigh Coal and Navigation Company, who were interested in running Durham boats and arks, appear to have spent considerable sums in blasting rocks at Tumble and Welle's Falls, and to have constructed numerous wings, of which remnants are yet to be seen at the Phillipsburgh Rift, at Bull's Falls, and at Welle's Falls.

The State of New Jersey does not appear to have ever made any appropriations for the benefit of the river, although at Phillipsburgh Rift there still exists what is called the "Jersey State wing," and which is said to have been built in 1824. In 1827 there appears to have been a project to construct in the river a slackwater navigation, and a survey was made to ascertain its feasibility. See Appendixes F and G, pp. 43, 44.) It was abandoned, however, and the Delaware Division Canal built instead. Nothing was done from this time till 1861, when the raftsmen raised by subscription the sum of \$1,100, which was spent in building a wing and blasting rocks at Tumble. In 1866 the State of Pennsylvania again appropriated \$10,000 to be expended in further improvements. A small amount of this was spent at Indian Rift, three miles above Easton, and the remainder at Welle's Falls and Wharford's Reefs, near Tumble. I shall allude to these expenditures again when giving in detail the history of the separate localities.

Beginning now at the northern limit of our survey, let us pass down the river, noting in detail its many interesting features, and the difficulties and obstructions to the present raft navigation. To avoid useless repetition, let me premise that, unless where otherwise stated, this description will refer to the ordinary low-water stage, for which the maps are also constructed.

Seven hundred feet below the upper bridge at Easton, where the Delaware has a width of less than 600 feet, it receives from the right the Lehigh River. This stream, here 169.5 feet above tide-water, is raised by a dam 12.8 feet above the first, and forms a part of the navigable communication to the coal regions of Carbon County, while also supplying water to the Delaware Division Canal, which, beginning here, will be continually on our right as we descend. Just below the junction of the Lehigh an outlet lock from this canal affords connection by means of a rope ferry with the terminus of the Morris and Essex Canal on the left bank. To facilitate the transfer of boats from one of these locks to the other a dam is erected under the two east spans of the railroad-bridge below, which raises the water about 1 foot. A raft, then, is obliged to pass under the span nearest the Pennsylvania shore.

When the Lehigh is swollen by floods, its violent current striking the raft tends to force it to the Jersey shore, and it requires at such times great skill on the part of the steersman to prevent it running against the middle pier. A considerable amount of

damage is done to rafts in this way every season. Immediately after passing under the railroad-bridges (see Appendix E, p. 42), which are built side by side, the Phillipsburgh Rift begins. It has a nearly straight course and a uniform descent for three-fourths of a mile, and presents no obstruction to the navigation. About 1,000 feet below its head the raft passes between two wing-dams, called the Jersey State wing and Shansi wing, which are 400 and 300 feet long respectively, built of loose stone, and are never above the low-water stage. These were built, the first in 1824, the other several years previous, to confine the water in the channel for the benefit of the ascending navigation. Below these wings are two large rocks, the Phillipsburgh Rock on the Jersey side rising about 2 feet above the surface of the water, and the Shansi Rock on the Pennsylvania side of a lesser rise.

Below the foot of the rift we enter upon calm water, with a depth of 4 to 10 feet, and a velocity of one to two miles per hour—a velocity which generally prevails in the pools for the first thirty miles of our course. Turning toward the eastward, the river makes a sharp curve called Bridelman's Bend, receiving the Lopatcong Creek near the Andover Iron-Works. Opposite these works is a reef of limestone rocks extending from the Pennsylvania shore two-thirds across the river, and rising 2 feet above the water; they present no difficulty, however, to the raftsmen, who easily clear them by steering near the Jersey shore.

At Whippoorwill and Clifford Islands the channel is between the islands and the Jersey shore, at each place occurring a rift, the first, however, having but a small fall. The islands are bare, gravelly shoals, hardly affording soil enough for the growth of anything but the commonest weeds, and having but a slight elevation above the water. The upper part of the islands consists of cobble and paving stones, quantities of which are annually carried by way of the canal to the Philadelphia market. During the summer season this business is followed all along the river by numbers of men, and seems to be a fruitful source of revenue. Towards the lower part of the islands the gravel becomes finer, and usually at the very end is an accumulation of fine sand, in which likewise a considerable trade is carried on. At the foot of Clifford's is a deep pool and eddy called "Queer Water," after passing which the channel runs through Old Sow Rift between Old Sow Island and the Pennsylvania shore. This rift consists of two pitches at the head and foot of the island, with a semi-pool between them, and has a total length of about half a mile. All along this part of the river the canal upon the right and the railroad upon the left follow closely its windings, raised from 15 to 30 feet above the water, and in many places defended from its action by sloping or vertical walls of stone.

On the Pennsylvania side rise high and steep wooded hills, while the opposite shore, with a less slope, is a rolling, farming region. Numerous limekilns are to be seen built into the hill-sides, which, from the rocks, are continually producing lime for agricultural purposes.

At Ground Hog Island, six and a half miles below the initial point, the river dashes against the Pohatcong Mountain upon its left bank, makes a turn of almost 90° , flows along its base for half a mile, and again sharply turning breaks through it at Rocky Falls. The course which a raft pursues at Ground Hog depends upon the stage of water. Whenever a freshet is high enough to entirely cover the Phillipsburgh Rock in the rift of that name, the steersman considers it safe for him to run between the island and the Pennsylvania shore. This is known as the high-water channel. During the past few years the island has been encroaching upon the channel, owing to jams of ice near its head. The stone-pickers have also filled in a considerable amount to facilitate the passage of their teams to and from the island. This choking up of the channel at present is a serious obstruction to rafts, numbers of which stick upon the gravel-beds every year and are compelled to remain perhaps weeks before getting off. The condition of this channel at low-water stage is better shown upon the maps Nos. 2 and 3 than can be described. Upon the other side of the island the current, at first 2.5 feet per second, soon increases to 4 and 5 feet, and bears a floating object against the rocks near the Jersey shore. The steersman, therefore, heads his raft at first directly for the upper end of the island, and keeps as close to its eastern side as the current will permit. Notwithstanding the vigorous pulling of the crew, the raft drifts toward the Jersey shore, so as to pass near Bogert's and Hoffman's Rocks, and often to strike upon them with great damage. Passing on 500 feet, the raft runs over the Lowry Rock, the Three Knobs, the Central and Little Rocks; meanwhile all the crew are employed in pulling the raft away from the shore with their long oars in order to escape Heineman's Point, a ledge of rocks projecting from the bank 250 feet into the stream, which, if passed in safety, they consider themselves as "through Ground Hog." The annual damage to rafts in these two channels is estimated to be \$3,000, a sum sufficient to remove the obstructions and put both in good order. Of these rocks, Heineman's Points are of the same character as the mountain, the old azoic gneiss; they have a strike of nearly northeast and southwest and dip about 30° southeast. The other rocks are hard quartzite of the lowest Silurian period, the Potsdam sandstone. Hoffman's and Heineman's Rocks rise from 3 to 4 feet above low water, and the others from 1 to 2. At the

foot of the island, near Heineman's Points, the water is very deep, probably about 40 feet, and around the other rocks it varies from 8 to 12 feet.

Between Ground Hog and Rocky Falls the river is only 500 feet wide, but the water is deep and the current slow. At the head of Rocky Falls is a large rock known as the "Entering Rock," about $4\frac{1}{2}$ feet out of water, and 35 feet long by 26 wide. The channel runs as near to this rock as possible; in high freshets over it. This will be seen to be necessary upon inspection of the map. If the raft is permitted to run nearer to the Pennsylvania shore, when it makes the sharp turn near the Entering Rock, the current will strike its side, forcing it against the vertical canal wall, or, if that is escaped, throwing it so far in that direction that it is impossible to clear "Calculation Rock" below. The channel course, then, is to run upon the Pennsylvania side of the Entering Rock, curving as soon as possible towards Jersey, passing over "Blowed Rock," (which was blasted about 1824 by the State of Pennsylvania from the appropriation of 1817, and is now only $\frac{1}{2}$ foot under water,) and running past Calculation Rock upon its Jersey side. After clearing Calculation, there are still three others, the Center, Right-Hand, and Three Knobs, in the channel, beyond which the remainder of the course presents no especial difficulty. Over \$2,000 is annually lost here by the lumbermen in damage and detention to rafts. More than one-half of which is due to the Entering Rock. During the spring and summer of 1872 seven rafts were stuck upon it, at an average expense of \$150 to \$200 each. The character of these rocks is the same as those at Ground Hog—a hard quartzite, known among the raftsmen as "mundock." Aside from these obstructions the depth of water is good—from 4 to 7 feet. Full details as to the size of these rocks will be given in the estimate of cost for their removal, further on.

Near the foot of Rocky Falls, the gneiss rock again makes its appearance in the river-bed, and continues upon both banks for a mile below. Then occurs a mile of limestone, which, resting upon the azoic in the Musconetcong Valley, extends also across into Pennsylvania. After passing another mile of gneiss, we enter below Durham upon the Triassic sandstone, which continues to inclose the river for the remainder of our course.

After passing through Gravelly, a short rift with a uniform pebbly bottom, and the pool near Riegelsville, Durham Falls occurs near the village of that name. At the head of the falls, on the Jersey side, is a wing dam to furnish water to a mill below. The rift, though only 500 feet long, has a fall of 3 feet; but the depth of water is good, and it presents no obstruction to navigation. Above these falls the Musconetcong River, a tributary important for its numerous water privileges, adds its volume to that of the Delaware. Below Durham the rift of Old Fry and Lynn's Falls, upon the Jersey side of an island of the same name, are passed in safety, and we enter at thirteen miles below our starting-point upon Noxamixon Falls. Here the river passes through the Musconetcong Mountain, whose base it has washed for the previous three miles. All along on the right bank, after leaving Durham, its cliffs of red shaly sandstone have risen perpendicularly for 300 to 400 feet, (p. 18,) beautifully adorned with dark evergreens and running vines; and below the Noxamixon Falls the same grand scene continues for two miles further upon the Jersey side. In the falls there are four small rocks, never rising above the water, which are sometimes troublesome to rafts of deep draught; but otherwise there is no difficulty. Two miles further is a long quiet pool, known as Upper Black's Eddy—the greatest landing-place for rafts upon this section of the river. Here in the spring season are often seen 50 to 100 rafts hauled up for the night. On the banks of the eddy, near the hotel, is a rock by which the steersmen judge of the stage of water, and is called the "Unlashing Rock." Its top is 3.7 feet and its base 1.8 feet above the low-water mark. When the water falls below its base it is considered extremely unsafe to "pull out" a raft to run through the dangerous places below. It is worthy of mention also that the only Durham boat now to be seen on the river lies here upon the bank dismantled and slowly rotting away.

Below Milford the river-hills are less abrupt, and cultivated land, with its deep red soil, is often seen. At the Lowerytown Bars, Ferman's Falls occur, near the Pennsylvania shore. These bars formerly extended across the river, and a channel was scooped about 1820, where the rift now exists. (See Appendix F, p. 43.) At present the water is from 1.5 to 4 feet deep, and no improvement is desired. At Stuhl's Falls three small boulders occasionally cause slight damage, but their removal seems hardly to be called for. The river here has a width of 1,000 feet, and below Frenchtown increases to half a mile, where it is filled with numerous islands. The raft-course here is to the Pennsylvania side of Man-of-War Island, then through Buttonwood and Little Howel's Rifts, upon the Jersey side of Marshall's and Ridge's Islands, and finally through Rush Rift, between Rush and Gondola Islands. All these rifts have a smooth gravel bottom, a fair depth of water, and are not difficult to navigate. The islands here are often covered with bushes, and sometimes trees, and have better withstood the action of freshets than those further up the river.

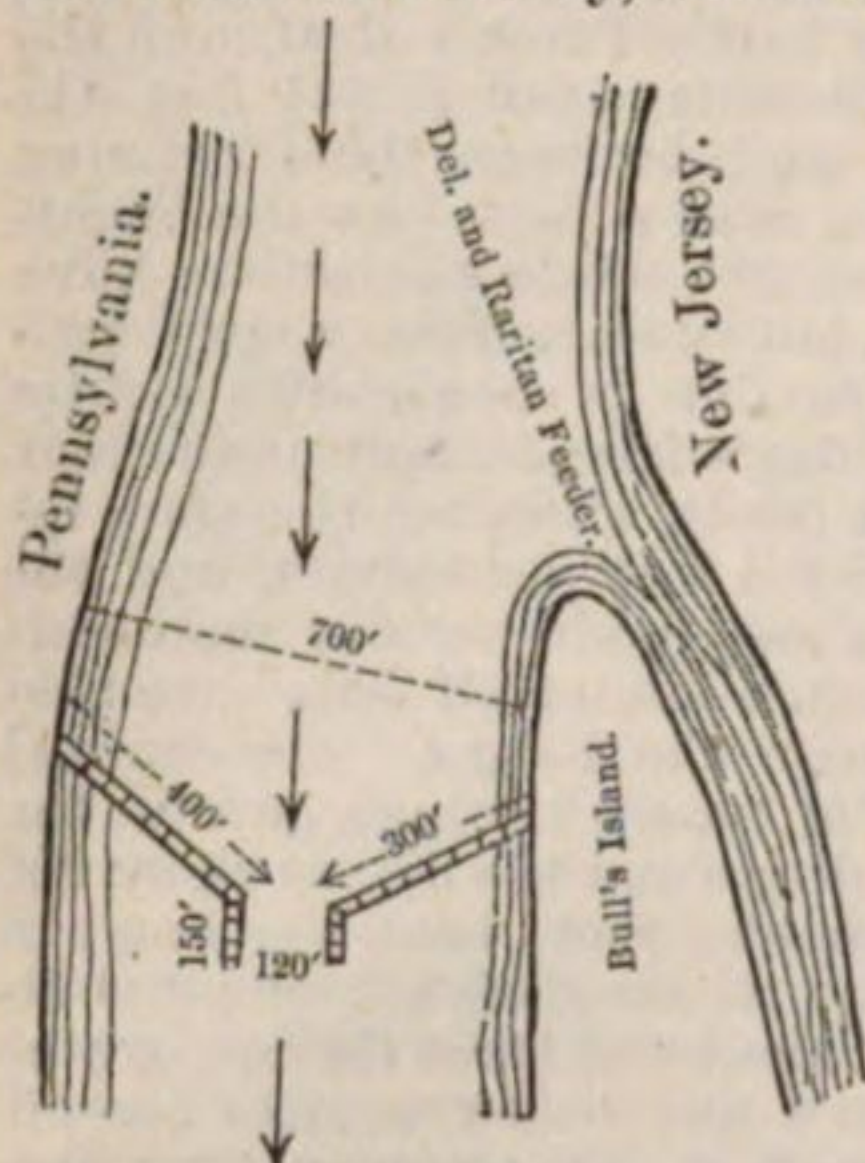
Beginning near Rush Island the river-hills again become more rocky and steep. Rising abruptly 300 feet, on the left bank, near this island, is the "Devil's Tea-Table," continuing southward several miles in a long wooded hill range, which has its counter-

part upon the other shore. These rocks, originally of soft shaly sandstone, have been subjected to the disturbing and heating action of a trap-dike, near Point Pleasant, and have been changed to a darkish or grayish color, while at the same time their hardness has been increased. Near the Devil's Tea-Table Mountain, and twenty-four miles from Easton begin the Wharford Reefs, the head of the locality generally known as "Tumble," which has always been one of the most difficult places to navigate upon the river, and has therefore been made the subject of a detailed survey, like Ground Hog and Rocky Falls.

As seen upon sheet No. 4, Tumble is about one and three-fourths miles in length. In the table upon page 16 I have divided it into Wharford's Rift and Tumble Falls, the former comprising a length from the head to above Little Tumble Reef, and the latter the remainder of the distance. In this length there is a fall of $14\frac{1}{2}$ feet, the water at intervals dropping over the reefs or ledges, and between them running swiftly like a rift. Some of these reefs raise the water over a foot. At the Wharford Reefs their strike is about northeast and southwest 70° , while the others have 80° . The dip is uniformly to the north or northwest, and varies from nearly zero to 15° or 20° . The width of the river is at first 1,100 feet, but is soon contracted by three large islands called, from their owner's name, Solliday's Islands, and at the foot of the falls it is only 500 to 600 feet. The velocity and depth of water therefore increase as we descend, the velocity varying from 3.3 to 6.4 feet per second, and the depth becoming 4 and 5 feet at the foot. The bottom along the low-water channel is mostly rock, and near the Pennsylvania shore it is gravel, while small beds have also formed in the high-water channel and in the rifts between the ledges. The channel course at first tends toward the center of the stream and passes through gaps in the first Wharford Reefs. These are three in number, extending from the Jersey shore 900 feet diagonally across the river. The middle one rises about a foot above the water in many places, while the others are of less height. Below these reefs the channel divides into two, depending upon the stage of water, and I shall first trace the low-water course, returning afterward to the other. Three hundred feet below are the second Wharford Reefs, two in number and parallel with the first. Our course then lies through a gap in this reef upon the left-hand side of "Foam Rock," curves still further to the left, runs along Kingler's old mill-wing, and, after passing Mill and Striker's Reefs, joins the other channel at the gap in Little Tumble Reef. Obstructions in the way of rafts occur at nearly all these reefs, and are yearly a source of much loss. The other channel, upon diverging from the first, passes between Foam Rock and Billy Parks's Wing, both of which are troublesome. This wing, which is 88 feet long and only rises slightly above low water, was constructed in 1861 by William Parks, with a part of the subscription raised by the lumbermen. It was placed, however, too near to the channel, and the logs of which it is made are greatly worn by the rafts which have rubbed upon it. Below this the channel continues in a nearly straight direction to the gap in Little Tumble Reef, passing over a gravel-bar near the head of Solliday's Island, which often causes trouble. At this reef there is a fall of three-fourths foot, but no difficulty occurs. After passing the Brink Reef, the channel curves to the right to shun the Horse Rock, where many rafts are injured, and below runs over the Big Tumble Dam. This near the Jersey shore raises the water 1 to 2 feet. There is a wide gap, however, for rafts, and its passage is easily made. Below this the raft runs over or around the Cut Bush Reef, where also much damage is done, and for the remainder of its course has a clear channel. This last reef is sometimes also called Catchpole, and in Appendix F it is classed as Cutson's Rift. Out of the appropriation of 1817 (Appendix G, p. 44) two or three thousand dollars were probably spent here. Traces of an old wing near the head, to confine water in the channel, still exist, which is said to have been built in 1820, and to have been still further improved in 1824, by the Lehigh Coal and Navigation Company. Blasting, also, was done at Little Tumble Reef and other points. In 1861 William Parks raised a subscription of \$1,100, with which he built the wing bearing his name, and blowed out rocks at Wharford's first reefs and the Horse Reef. The work seems, however, to have been poorly done, and, while costing \$1,100, "caused \$11,000 damage the next year," to quote the opinion of a prominent raftsman. Out of the appropriation of 1866 the State of Pennsylvania spent here from \$2,000 to \$2,500 in widening and deepening the gaps at Wharford's Reef. An annual loss of from \$3,000 to \$4,000 at present occurs here, notwithstanding these improvements. The plan of improvement which I propose is to throw into the channel, by means of wing-dams, a greater quantity of water, thus increasing the depth, and to still further continue the blasting at the dangerous points.

Below the foot of Tumble we pass the Point Pleasant bridge, and enter Lower Black's Eddy, a stopping-place of less importance than Upper Black's. At the foot of this eddy, near the Pennsylvania shore, is also an "unlashing rock," in which, many years ago, an iron bolt was inserted to mark the low-water stage. Owing to the dams at Bull's Island the water now never falls below this bolt, (see Appendix C, p. 40.) Three-fourths of a mile below the unlashing rock is the head of Bull's Island, and the entrance to the feeder of the Delaware and Raritan Canal Company, at present controlled by the

Pennsylvania Railroad Company, which here takes its water from the river. This feeder was built in 1832-'34, under authority of the States of New Jersey and Pennsylvania, (see Appendix G, p. 44.) and for many years received an abundant supply from the river without the aid of dams to raise the water. The great decrease in the stage and quantity of water during the summer seasons in the past few years has compelled the company to put in every spring, below the head of the feeder, a temporary dam to raise the water from 1 to 2 feet. This dam consisted of an inclined trestle-work, covered with plank, and held in its place by the weight of water, involving, however, an annual expense of over \$2,000. The Pennsylvania Railroad Company obtained a charter in 1868 from New Jersey, and in 1872 from Pennsylvania, to build a permanent dam, which



is now in process of construction, (Appendix G, pp. 44 and 45.) It consists of two wings, one of 400 feet in length, running from the Pennsylvania shore, and one of 300 feet, from the island. These slope down stream so as to make an angle of 60° or 70° with the current, leaving between them a space of 120 feet for the passage of rafts. The wings are also to be extended 150 feet down stream, parallel with the current, to form a more safe chute. These wings are to be built with cribbing 25 feet in width, filled with stone, and still further backed with stone for 10 or 15 feet. They are not to raise the water more than 18 inches, by the terms of the charter. At present only the east wing is completed; the other will be constructed during the next summer and autumn, and the total expense is estimated at \$25,000 or \$30,000. It is not apprehended by the raftsmen that this structure will injure the navigation of the falls below, as the depth of water is good, the fall uniform, and the bottom smooth and gravelly.

Near the foot of Bull's Falls is still to be seen one of the old State wings, built about 1820, to facilitate the Durham boat and ark navigation. It is about 400 feet long, nearly parallel to the channel, and is a benefit to the present navigation. At thirty miles below Easton is Paxon's Island, where we find upon the eastern side Eagle Rift and Howell's Rift, the former offering no obstruction, but the latter contains three rocks just cropping out at the low-water stage, which are occasionally hit by rafts. These are called the Three Brothers, and are red, shaly sandstone, each being about 3 by 6 feet. Below the rift also is a ground-bar, where, in low stages, a raft of deep draught sometimes strikes, which turns it from the channel against a bridge-pier below. These accidents are so exceptional, however, that it seems unnecessary to recommend any expenditure here. It is well, perhaps, to remark that the navigation of all the rifts below Bull's Island is now more difficult in low freshets than was formerly the case before the construction of the feeder at that point, owing to the less quantity of water which the river receives. In freshets, when a raft can run safely on the upper waters of the Delaware, it is often forced to tie up at Upper or Lower Black's Eddy, and remain perhaps for several weeks before a rise occurs sufficient to enable it to traverse the remainder of the course.

Passing Bird's Point, Limestone Rift is met at one mile above Lambertville, receiving its name from the unusual appearance of a small ridge of limestone rock projecting out of the sandstone. Here are also two rocks near the channel, the "Chamberlain," about 5 by 5 feet, and another 4 by 5 feet, rising about one-half foot above low water, with a depth of 4 feet around them.

Lambertville, New Jersey, thirty-five miles below our starting-point is, next to Easton and Trenton, the most important town on this part of the river. It is the headquarters of the Belvidere Division Railroad, and a lively manufacturing village.

The river hills are increased in height by several trap ridges, one range of which, crossing the river a mile below the town, causes the rocky and dangerous rapid known as Welle's Falls, which has always caused to lumbermen more loss than any other place* on the entire river.

After passing the bridge, between Lambertville and New Hope, the river has a width of 1,000 feet, a depth of 4 to 6 feet, and a velocity of less than 1 foot per second. Here are the outlet-locks of the Delaware Division and Raritan Canals, and a rope-ferry to transfer boats across the river. About 1,000 feet below are the dams, constructed to facilitate this transfer and to supply water to the Delaware Division Canal, which raise the water $3\frac{1}{2}$ feet. These, after running out from the banks toward the channel, are extended down stream for 500 feet, forming a narrow chute 150 feet wide, through which, at low water, nearly the whole discharge of the river passes. To prevent the spreading of the water, after issuing from this chute, there are constructed below it

*Foul Rift, twelve miles above Easton, may perhaps be excepted.

two short wings on either side of the channel known as La Barre's and Whittaker's wings. As a raft passes through this chute the velocity of the front end is suddenly accelerated, and in the communication of this motion to the slower moving hind end it

"dives" under the water and is subjected to violent strains. In running to the lower end of La Barre's wing, a distance of 400 feet, it falls 4.7 feet, and for the next 3,700 feet 9.6 feet. Immediately after passing the lower wings the current drives the raft toward Price's Rock with a velocity of 7 or 8 feet per second, near the Jersey shore. This rock is from 1 to 2 feet above the water, and to prevent the raft from hitting it the steersman is forced to run over both Center and Foam Rocks, which rise only slightly above low water. It is at Foam Rock that the majority of accidents now occur, lying as it does directly in the channel, and presenting an abrupt face to the current. (See plan below.) Below this the channel is bordered with many rocks, (the bottom in fact being all rock,) but no difficulty occurs until near the foot of the rapids, where Fish and Flat Rocks obstruct the course, the latter causing many losses.

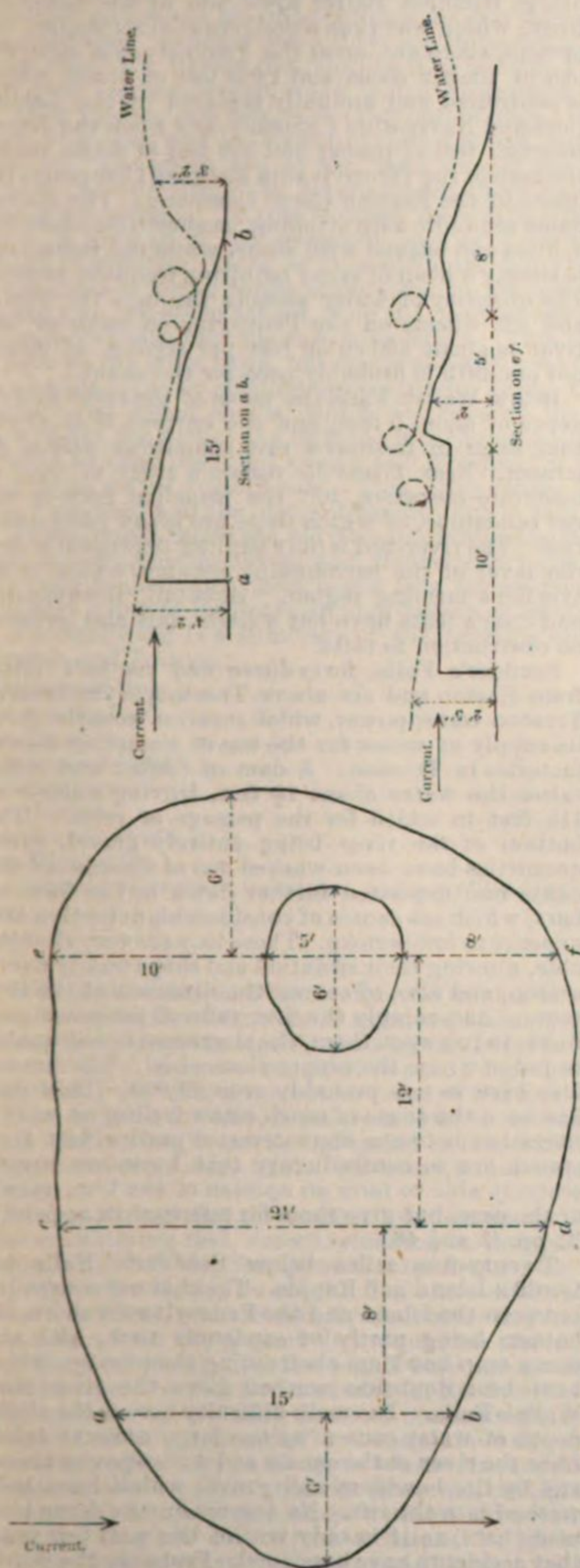
The way in which accidents occur there is briefly: The raft in running the chute dives, perhaps breaking its lashing-poles or displacing logs, then running over Center and Foam Rocks it strikes, causing the raft to separate or break up; if this, however, is escaped the same may occur at Flat Rock. The annual loss to lumbermen from these obstructions is about \$5,000.

The traditions that I have gathered concerning Welle's Falls show that it was formerly more dangerous than at present. Many accidents have occurred, of which records are preserved in the names of the rocks, only a few of which I shall here mention. About 1810 a Durham boat loaded with buckwheat-flour was wrecked on a rock now known as "Buckwheat," and another at the rock called "Hundred Barrel." About 1818 a raft struck Foam Rock drowning one of the crew named Harding, and in 1824 an ark was also wrecked, killing George Croupe. The present wing-dams were not then built, but their place was partly supplied by wings to furnish water to saw and grist mills on either side of the river.

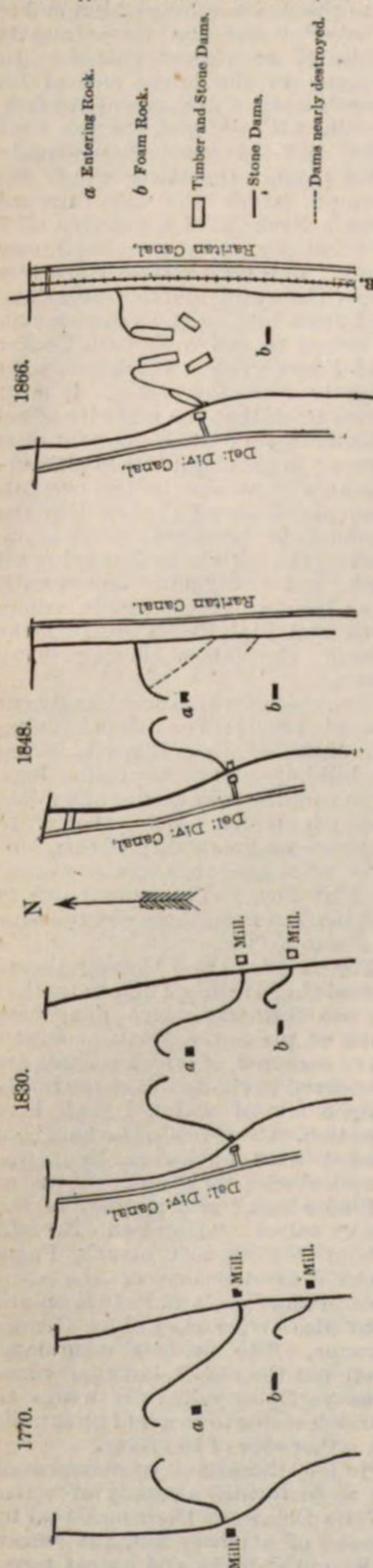
In 1830 these dams were improved so as to furnish a supply of water to the Delaware Division Canal by means of a power and lift wheel.

In 1848 this canal was connected with the Raritan by outlet-locks and a rope ferry, and the dams still further improved.

In 1866 there were expended about \$7,000 out of the appropriation of that year, and



probably as much more by the canal companies, in putting in additional dams. The blasting done here has been, at Blowed Rock, in 1824, by Lehigh Coal and Navigation



Company, and, in 1866, by the State of Pennsylvania, at Hundred Barrel Rock and at the Entering Rock, which was then a dangerous obstruction. At present there are, upon the Pennsylvania side, 900 feet of timber dams and 1,050 feet of stone, which is controlled and annually repaired by the Lehigh Coal and Navigation Company, and upon the Jersey side 650 feet of timber and 550 feet of stone, under the care of the Pennsylvania Railroad Company, the lessee of the Raritan Canal Company. The timber dams are built with cribbing, as shown on sheet No. 5, filled and backed with stone, while the remainder is simply a heap of stone requiring frequent repairs. The quantity of water passing through the power and lift wheels on the Pennsylvania bank of the river is about 400 cubic feet per second, of which not one-fifth is probably used for the canal.

Below Welle's Falls the pools of the river have a depth of about 5 feet, and the current is so slight that even in freshets a raft sometimes moves up stream. Near Titusville occurs a ridge of trap of moderate elevation, but the principal rock is the red sandstone, of which there are many good quarries. The river-bed is only slightly depressed below the level of the surrounding country, which is an excellent farming region. Bucktail, Beaumont's, and Carr's Rifts have but a slight fall and present no obstruction to rafts.

Scudder's Falls, forty-three and one-half miles from Easton and six above Trenton, is the head of Trenton water-power, which receives from the river its supply of water for the use of numerous manufactories in Trenton. A dam of timber and stone raises the water about $1\frac{1}{4}$ feet, leaving a chute of 115 feet in width for the passage of rafts. The bottom of the river being entirely gravel, great quantities have been washed out at the end of the chute and deposited further down in the form of bars, which are causes of considerable detention and expense to lumbermen. These bars are very changeable, altering their situation and shape nearly every season, and also, of course, the direction of the currents. Accordingly the first rafts of the season are liable to run upon them, the steersman being unable to judge where the proper channel is. The annual loss here is not probably over \$1,000. This dam has been the cause of much bitter feeling as well as litigation between the interested parties, but their stories are so contradictory that I confess myself scarcely able to form an opinion of the true merits of the case, but give them for reference in appendix K, pp. 45 and 46.

Twenty-five miles below Scudder's Falls are Gould's Island and Rapids. The channel course lies between the island and the Pennsylvania shore, the bottom being partly of sandstone rock, and also many trap boulders obstructing the passage which have been doubtless washed down the river from Welle's Falls. The main difficulty here is the slight depth of water caused by the large amount taken from the river at the canals and water-power above, and by the boulders and gravel which have been washed into the rift. No improvements have been made here, as it is only within the past few years that accidents have happened. Probably the yearly loss is less than \$500.

Below Gould's is a small gravelly shoal covered with a few bushes, now called Cisil Island. Formerly it was much larger and well wooded, and was called Blackguard

Island, as it was a favorite resort of indigent gentlemen of leisure. The channel passes between this shoal and the Pennsylvania shore, near several rocks which are just under low water and occasionally troublesome. These are called Nigger Head and Kirkbright, the former about 5 by 3 feet and the latter 7 by 6; and a few others without names are also near the channel, but they rarely cause accidents except through carelessness. Further down there are three rocks, never dangerous, by which the raftsmen steer, the Marble Roll, Cocked Hat, and Sun Fish Ripple, the latter 1,200 feet above the new Trenton bridge, below which we enter upon Trenton Falls.

After passing this bridge the raft enters upon shallow water, among numerous rocks and boulders, and in 3,400 feet falls 7.5 feet, with a velocity of about five feet per second. The rocks are at the head mostly the bed-rock of gneiss, but at the foot, where the tide meets the river-current, there have accumulated numerous boulders and a gravel-bar. To run through these falls without hitting a rock requires great skill on the part of the steersman, and it is estimated that an annual loss of about \$2,000 is suffered. Here, as at Gould's, accidents now happen more frequently than in former years, owing to the diminution in the quantity of water. Upon the Pennsylvania side lies Moon Island, from the head of which a wing-dam is built to turn water behind the island for the saw-mills below. This island, I have been told, was formerly a part of the main bank, but was separated from it about two hundred years ago, in a land-slide, and the channel formed in its rear. Upon the opposite side of the river there exist broad shoals, which are covered by rises of 3 and 4 feet. About 1,000 feet above the foot of the falls the raft-channel divides the main one, running over the gravel-bar and the other known as "Woodpecker Lane," avoiding it by passing among the rocks on its western side. This latter course is rarely taken by rafts, as the rocks are numerous and the channel narrow, but is used by scows and small boats.

Immediately below the old Trenton bridge the Delaware becomes a broad tidal river, and is navigable for sloops and steamers of light draught. The usual landing-place for rafts is about one mile below this bridge, from which they are towed to market, the logs going to Bordentown and the sawed lumber mostly to Philadelphia.

The following is a summary of the average annual losses to lumbermen between Easton and Trenton:

At Ground Hog.....	\$3, 000
At Rocky Falls.....	2, 000
At Tumble.....	3, 500
At Welle's Falls.....	5, 000
At Scudder's Falls.....	800
At Gould's.....	500
At Trenton Falls.....	2, 000
At Noxamixon.....	.....
At Stuhl's, Howel's, Limestone, and near Blackguard Island.....	500
	17, 300

It is to be understood that very little lumber is ever lost or destroyed, but that the loss occurs in the detention of rafts, a double expense being then necessary to float it to market, (since the crew is paid by the trip,) or in the breaking up of the raft, when several days' labor are required to put it together again. The loss will be seen to be less than 1 per cent of the entire value of the lumber. Upon a careful consideration of all the facts in the case, it seems evident to me that to put the present raft channel in such order that it can be navigated in low water, would require the expenditure of a large sum of money. This, however, is not required in the interests of the lumber trade.

Remembering that the lumber business on the Delaware is every year decreasing, and considering that, notwithstanding an annual loss of over \$17,000, I have been unable to find but very few persons interested in the movement, it seems doubtful if any appropriation should be asked. But since rafts are only run at stages of water greater than 1 or 2 feet, and are usually steered by experienced pilots, improvements could be made by which the present loss would be almost entirely obviated at a moderate expenditure of money. Such a plan I here present for the seven localities where the detailed surveys were made, and also for the five localities mentioned above where slight obstructions occur; wing-dams in correspondence with those at present existing on the river to be constructed to deepen the water in the channel, and blasting and removal of gravel-bars to be done where the accidents now occur. In making this estimate I have supposed that the labor will cost \$240 per day, and that the work is to be done at the low-water stage without interruption from freshets. At Ground Hog, I propose that the Pennsylvania Channel be dredged or scooped with ox-teams, using ordinary road-scrapers, and the gravel be removed to the head of the island and formed with cedar-brush into a wing which will throw water into the channel and still further deepen it, and that the following rocks be removed to a depth of 1 foot below low-water mark.

Name or locality.	Average length and breadth.	Average height above low water.	Depth of water around rock.	Cubic feet to be removed.	Kind of rock.	Number of drill- holes probably required.	Depth of each hole.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>				
Hoffman's Rock	14 by 10	3.0	4 to 9	560	Hard quartzite.	25	1 to 2
Small rock near last	4 by 3	0.3	4 to 9	14	do	2	1.5
Bogert's Rock	18 by 9	1.0	8.0	298	do	12	1.5
Lowery Rock	13 by 8	0.5	8.0	156	do	6	1.5
Central Knob	5 by 3.5	0.4	8 to 10	23	do	2	1.0
Little Rock	9 by 6	1.0	12.0	108	do	5	1 to 2
Three Rocks	{ 6 by 3.5 4 by 3.5 6 by 5 }	{ 2.0 1.5 }	12.0	158	do	8	1 to 2
Small rock near last	3.5 by 2	1.5	12.0	18	do	2	2
Heiniman's Points	{ 23 by 10 23 by 8 20 by 15 }	{ 3.0 }	20 to 30	2,372	Gneiss	50	1 to 2
Total				3,707			

Estimate.

Dredging 800 feet long, 70 feet wide, and to a depth of 1 foot below low water—say 2,000 cubic yards—and building wing 350 long, 5 feet on base, and 2 feet on top, and 3 feet high, of brush, stones, and gravel	\$800 00
Removing 3,707 cubic feet rock, at 33 cents	1,223 31
Total for Ground Hog	2,023 31

At Rocky Falls, the following rocks should be removed:

Name of rock.	Average length and breadth.	Average height above low water.	Depth of water around rock.	Cubic feet to be removed.	Remarks.	Number of drill holes probably required.	Depth of holes.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>				
Entering Rock	36 by 27	3.0	4 to 7	3,288	These rocks are hard quartzite	100	...
Calculation Rock ..	{ 12 by 4 7 by 5 3 by 2 4 by 2 }	3.0	6.5	355	October 10 tried drilling in Entering Rock. First drill went 2.5 inches, in 30 minutes; with second went 2 inches, in 20 minutes. Hole being thus made 1.5 in diameter and 4.5 in depth, and both drills being badly dulled and broken.	15	1.5
Centre Knob	3 by 2	0.0	4 to 6	6			2 1.0
Right-Hand Knob ..	6 by 2	2.0	4 to 6	36			3 2.0
Three Knobs	{ 6 by 2 6 by 3 2 by 2 }	2.5	4 to 6	99			7 ...

Total cubic feet in Rocky Falls, 4,384; at 33 cents, is \$1,446.72.

The great width of the river at the head of Tumble causes the depth of water in the channel to be slight. I propose to erect two wing-dams to concentrate or deepen the water in the channel, and to remove reefs and gravel-bars, which are now dangerous. Upon the Pennsylvania side of the channel, on the site of the old State wing, a wing should be built of timber and stone in a substantial manner, as it will be liable to accidents from floating ice in the winter. It should be 360 feet long, 6 feet wide, and 5 feet high, the cribbing formed as shown in sheet No. 4, the lower ties fastened with pins, and the upper with bolts. Upon the Jersey side a wing should run from the shore, 830 feet, upon the first Wharford Reef formed by a single range of timber, bolted to the rock, and protected by a backing of stone. Parks's wing being nearly in the channel, the eastern part should be removed, and Kugler's Mill wing, now not used for mill purposes, should be repaired at the breaks, to prevent water settling against rafts, and forcing them upon the opposite reefs. In the high-water channel a slight amount of scraping at the gravel bar will be necessary, and the following rocks ought to be removed:

Name or situation of rock west of channel.	Average length and breadth.	Average height above low water.	Depth of water around rock.	Cubic feet to be removed.	Number of drill holes probably required.	Depth of holes.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>			<i>Feet.</i>
At first Wharford's Reefs*	15 x 10	0.1	2 to 3	150	6	1.0
At first Wharford's, in channel		0.4	1 to 2	50		0.8
Between first and second reefs			2 to 3	30	2	1.0
Wharford's second reef,† above Foam	18 x 12	1.0	1 to 2	324	12	1.5
Foam	40 x 15	0.8	1 to 3	800	30	2.0
Knobs below Foam, in southwest channel		-0.5	1.0	20		
Rock, 460 feet above Mill Reef	7 x 4	0.7	1.0	56	2	1.5
Mill Reef, east end‡	10 x 3	1.0	2 to 3	60	3	1.5 to 2
Rock, 200 feet below Mill Reef	12 x 8	1.0	1.0	192	7	1 to 2
Striken Reef, east end			1 to 2	100	4	1 to 2
Horse Rock	10 x 10	0.5	1 to 3	100	4	1.5
Rock, 100 feet below Big Tumble	8 x 3	0.5	3 to 5	48	2	1.5
Cut Bush Reef	40 x 12		3 to 4.5	960	30 or 40	
Total cubic feet				2,890		

* These rocks are all altered red shale, but will drill easily with 1½-inch drill and one hammer. I put a hole 6 inches deep in one hour without hardly dulling the drill.

† One hole already drilled, probably in 1866, 6 inches deep and 1.5 inches diameter.

‡ This rock has a bolt 1 inch diameter set into it and bent over. Why it was put there is unknown.

Estimate of expense of improvement at Tumble.

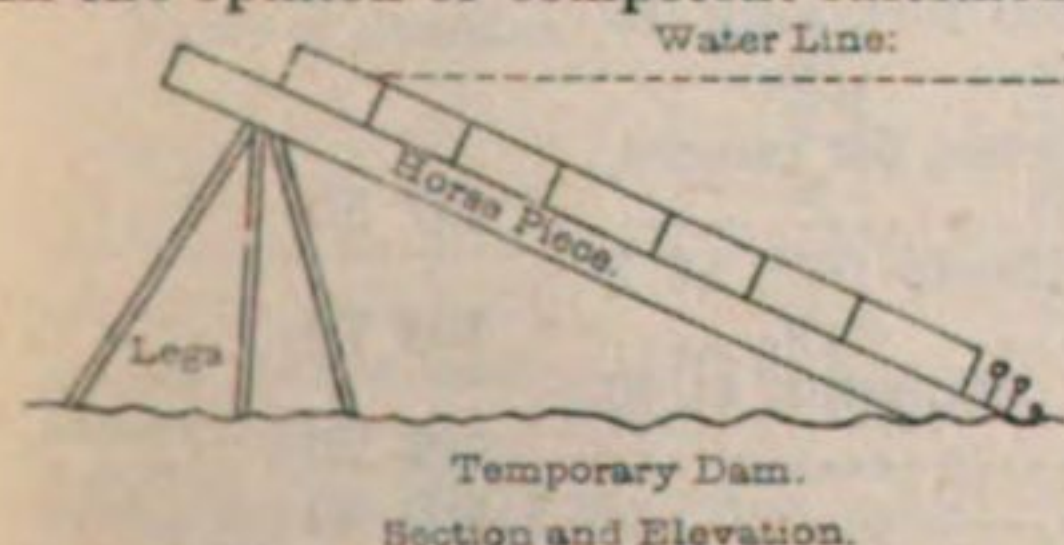
Wing on site of old State wing; 360 feet long, 6 feet wide, 5 feet high:

1,440 linear feet hemlock log, 16 inches diameter, for ranges, at 5 cents.	\$72 00	
122 hemlock ties, 7 feet long, 12 inches diameter, 854 linear feet, at 5 cents	42 70	
122 bolts, 18 inches long, 1 inch diameter, at 40 cents	48 80	
200 days' labor, building and filling with stones, at \$2.40	480 00	
		\$643 50

Wing on first Wharford's reef, 830 feet long, 3 feet wide, 1 foot 5 inches high:

830 linear feet oak logs, 12 inches diameter, at 25 cents	207 50	
208 bolts, 18 inches long, 1 inch diameter, at 40 cents	83 20	
200 days' labor drilling rock, building, &c., at \$2.40	480 00	
		770 70
Repairs to Rudler's and Parks's wing		160 00
Dredging gravel bar 500 feet long, 70 feet wide, and to a depth of 1 foot below low water, say 800 cubic yards, at 30 cents		240 00
Removing 2,890 cubic feet rock, at 33 cents		953 70
		2,767 90

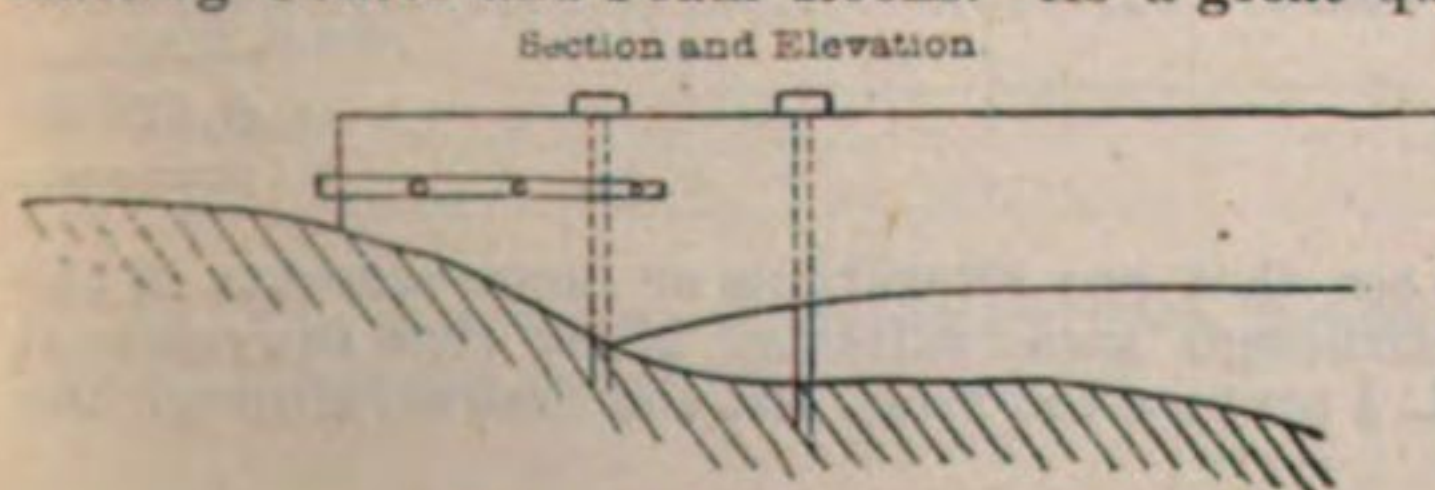
At Welle's Falls there ought to be some means devised to prevent the driving of rafts. In the opinion of competent raftsmen this can best be done by putting an apron in the



Section and Elevation.

chute, consisting of logs 60 or 70 feet long, fastened 3 feet apart by their upper ends, and the lower ends free to float. Each log is to be strengthened by a clevis and secured by bolts firmly to the rock. To put this apron in its place a temporary or coffer dam will be required, and can be made in the way ordinarily followed on the river, it being held in its place by the weight of

water. The same timber can afterward be used for the temporary dams needed in blasting Center and Foam Rocks. As a great quantity of water now passes around



Section and Elevation.

the end of Whittaker's wing and is useless for navigation, I propose to throw it into the channel by extending the wing farther up stream, and also to further protect the channel by an additional wing running from Price's Rock to La Barre's wing; these wings to consist of

timber cribbing filled with stone like those at present existing, and as shown on sheet No. 5.

The following rock also should be blowed :

Name or situation.	Average length and breadth.	Average height above low water.	Depth of water around rock.	Cubic feet to be removed.	Number of drill-holes required.	Depth of holes.	Remarks.
Centre Rock.....	10 x 6	0.0	2 to 5	60	8	1.0	These rocks are trap, nearly pure hornblende and quartz, and hard to drill. With one hammer I drilled a 1½-inch hole 4 inches deep in one hour, dulling two drills badly.
Rock 40 feet above Centre	4 x 5	0.3	3.5	60	.....	.....	
Foam Rock.....	32 x 20	0.0	3 to 5	1,920	50 or 60	.....	
Flat Rock.....	25 x 15	0.0	5 to 6	750	25	1 to 2	
Total cubic feet.....	.....	.....	.....	2,790	.....	.....	

In the following estimate I include the cost of the timber for the temporary dams, and to allow for the expense of putting it up at the various rocks, I put the cost of blasting at 40 cents per cubic foot instead of 33, as heretofore.

Temporary dam, for putting in apron and drilling rocks :

12 oak horse-pieces, 15 feet long, 1 foot diameter, 180 linear feet, at 10 cents.....	\$18 00	
36 oak logs, 7 feet long, 6 inches in diameter, 252 linear feet, at 10 cents.....	25 20	
2,400 feet, board measure, hemlock plank, 2 inches thick, at \$20..	48 00	
150 pounds spikes for upper and lower planks, logs, &c., at 5 cents.	7 50	
		\$98 70
30 pine logs, 70 feet long, 2 feet in diameter, 2,100 linear feet, at 25 cents.....	525 00	
30 clevises, 7 feet long, 3 inches wide, ¾ inch thick, at \$4.....	120 00	
90 clevis-bolts, 2 feet long, 1 inch in diameter, at 40 cents.....	36 00	
60 bolts for logs, 3 feet long, 1½ inches in diameter, at 60 cents....	36 00	
40 days' labor, to put in temporary dam, at \$2.40.....	96 00	
400 days' labor, to put in apron, at \$2.40.....	960 00	
		1,773 00

Extension of Whitaker's wing, 250 feet long, 15 feet wide, and 6 feet high :

2,250 linear feet hemlock logs, 18 inches in diameter, for ranges, at 5 cents.....	112 50	
153 ties, 18 feet long, 1 foot in diameter, 2,754 linear feet, at 5 cents	137 70	
153 bolts, for top ties, 18 inches long, 1 inch in diameter, at 40 cents.....	61 20	
500 days' labor, at \$2.40.....	1,200 00	
		1,511 40

Wing on Jersey side from Price's Rock, 350 feet long, 15 feet wide, and 6 feet high :

3,150 linear feet hemlock logs, 18 inches in diameter, for ranges, at 5 cents.....	157 50	
213 ties, 18 feet long, 1 foot in diameter, 3,834 linear feet, at 5 cents.....	191 70	
213 bolts, for top ties, 18 inches long, 1 inch in diameter, at 40 cents.....	85 20	
700 days' labor, at \$2.40.....	1,680 00	
		2,114 40
Removing 2,790 cubic feet rock, at 40 cents.....	1,116 00	
		6,612 50

At Scudder's Falls, I am unable to see that any alterations or improvements in the dams would remove the bars below, although many raftsmen claim that the removal of the dam would benefit the channel. I propose to dredge out the channel through the

gravel bar, to a sufficient depth to allow the free passage of water, which will then probably keep the course open.

Dredging 700 feet long, 90 feet wide, and to a depth of 2.5 feet below low water, say :

1,000 cubic yards, at 40 cents \$400 00

At Gould's Rift, I suggest two stone wings to throw water into the channel, and that the following boulders and rocks be removed :

Name or situation.	Average length and breadth.	Height above low water.	Depth of water around rock.	Cubic feet to be removed.	Number of drill-holes probably required.	Depth of drill-holes.	Remarks, &c.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>			<i>Feet.</i>	
First and second breaks... {	3 by 3 {	0.0	1 to 3	42	3	1.5	Gray trap boulders.
	6 by 2 }						Do.
Gould's Rock	5 by 3	0.4	2.0	30	1	2.0	Gray trap boulders ; 3 to be removed.
Part of Kimball's nest		0.4	1.5	20			Gray trap boulders ; 1 to be removed.
Nest below Kimball's.....	4 by 2	0.1	1.5	8	1	1.0	Gray trap boulders.
Jersey Rock	by 2.5	0.0	1.5	15	1	1.0	Red sandstone boulder.
Red Back Rock	5 by 4	0.2	1.5	36	1	1.0	Trap boulder.
Mitchell's Rock.....	5 by 5	1.6	1.7	50	3	1.5	Red sandstone boulder.
Beagle Rock	6 by 3	0.4	1.5	18	2	1.0	
Total				219			

The estimate for improvements at Gould's is, then :

A stone wing at head of island 300 feet long, 5 feet wide on base, 2 feet on top, and 3 feet high, at \$1 per linear foot	\$300 00
A stone wing from Simmons's Rock toward shore, 270 linear feet, other dimensions as above, at \$1.....	270 00
Removing 219 cubic feet of rock, at 40 cents.....	87 60
	<u>\$657 60</u>

At Trenton Falls, a wing should be built to deepen the water in the channel, the gravel-bar should be dredged, and the following rocks removed :

Name or situation.	Average length and breadth.	Height above low water.	Depth of water around rock.	Cubic feet to be removed.	Number of drill-holes required.	Depth of holes.	Remarks.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>			<i>Feet.</i>	
End of Yellow Reef	4 by 2.....	0.0	2.5	16	2	1.5	These rocks are mostly horn-blendic gneiss.
Center break		0.0	2 to 3	160			
4 Jersey Way Rocks.....	Each 4 by 2	0.5	2 to 3	64	2 for each		
14 boulders on Grand Bar.	Each about 5 by 3.	0.5	0.5 to 2	420	do	1.5	
Bobby.....		0.0	3.0	160		1.0	
Small knob on Upper Division Rock.	3 by 2.....		3.5	6	1	1.0	
Total.....				826			

As loose stones are not numerous here, the fragments of these rocks would be useful in building the stone wing.

Estimate for Trenton Falls.

A stone wing 500 feet long, 5 feet wide on base, 2 feet on top, and 3 feet high, at \$1.60 per linear foot.....	\$800 00
Dredging 600 feet long, 80 feet wide, and to a depth of 1.5 feet below low water, 1,200 cubic yards, at 40 cents	480 00
Removing 826 cubic feet of rock, at 40 cents	330 40
	1, 610 40

For the five localities where detailed surveys were not made, I estimate:

At Noxamixon Falls, removing 4 rocks, not to exceed 400 cubic feet, at 50 cents	\$200 00
At Stuhl's Falls, removing 3 rocks, not to exceed 300 cubic feet, at 50 cents.	150 00
At Howel's Rift, removing 5 rocks, not to exceed 200 cubic feet, at 50 cents.	100 00
At Howel's Rift, dredging gravel-bar, not to exceed 1,200 cubic feet, at 30 cents	360 00
At Limestone Rift, removing 2 rocks, not to exceed 100 cubic feet, at 50 cents	50 00
At Blackguard Island, removing not to exceed 220 cubic feet, at 50 cents..	110 00
	970 00

It only remains to sum up the amounts for the different localities, and to add the necessary incidental expenses, to complete the estimate:

Ground Hog	\$2, 023 31
Rocky Falls.....	1, 446 72
Tumble	2, 767 90
Wells's Falls	6, 612 50
Scudder's Falls.....	400 00
Gould's Rift.....	657 60
Trenton Falls	1, 610 40
Noxamixon Falls, Stuhl's Falls, Howel's Rift, Limestone Rift, and Black-guard Island	970 00
	16, 488 43
Inspector, six months.....	700 00
Assistant engineer, six months.....	600 00
Traveling expenses.....	200 00
Office-work	300 00
Advertising.....	200 00
	18, 488 43
Add 25 per cent. for unforeseen expenses.....	4, 622 11
	23, 110 54

It appears, therefore, that a very small sum comparatively will so far improve the navigation of this portion of the river as to yearly save over \$17,000, (see p. 23,) and greatly reduce the present risk and danger attending those who navigate the rafts.

In concluding this report I wish to acknowledge the valuable assistance of Mr. A. Mitchell, secretary of the Lehigh Coal and Navigation Company, and of Mr. J. A. Anderson, superintendent of the Belvidere Division Railroad, in allowing me copies of the canal and railroad maps; and the important information received from Mr. Ashbel Welch, chief engineer of the United Railroads of New Jersey, concerning the regimen of the river, and particularly to mention my indebtedness to Captain L. B. La Barre, the pilot upon the survey, from whose thorough practical acquaintance with the river I have derived a large part of the results here given.

Very respectfully, your obedient servant,

M. MERRIMAN,
United States Assistant Engineer.

Lieutenant-Colonel J. D. KURTZ,
Corps of Engineers.

APPENDIX A.

[Map—see original.]

APPENDIX B.

Statistics of sawed lumber for the year ended June 1, 1860. (From United States census reports.)

Locality.	Number of mills.	Capital invested.	Cost of raw material.	Number of hands employed.	Annual value of lumber produced.
Broome County, New York.....	80	\$163,800	\$75,900	166	\$164,710
Delaware County, New York.....	166	137,000	106,171	243	201,745
Sullivan County, New York.....	136	250,100	101,444	305	286,603
Pike County, Pennsylvania.....	22	95,000	25,375	62	48,985
Wayne County, Pennsylvania.....	107	254,800	190,325	280	413,940
Above counties.....	541	900,700	499,215	1,056	1,115,983
New York.....	2,765	7,425,601	5,116,838	7,678	9,710,945
Pennsylvania.....	3,030	10,903,064	5,110,079	9,163	10,743,752
New York and Pennsylvania.....	5,795	18,328,665	10,226,917	16,841	20,454,697
The United States.....	19,699	72,503,894	43,156,903	71,878	93,338,606

Statement of annual average production of sawed lumber by mills at and below Easton from logs brought from the Upper Delaware.

	Feet, board measure.
At Easton, Pennsylvania, 8 mills produce annually about.....	5,000,000
At Lopatcong Creek, New Jersey, 1 mill produces annually about.....	300,000
At Carpenterville, New Jersey, 1 mill produces annually about.....	300,000
At Ground Hog, New Jersey, 1 mill produces annually about.....	600,000
At Musconetcong, New Jersey, 3 mills produce annually about.....	3,000,000
At Durham Falls, New Jersey, 1 mill produces annually about.....	1,000,000
At Gallous Run, Pennsylvania, 1 mill produces annually about.....	1,500,000
At Lynn's Island, Pennsylvania, 1 mill produces annually about.....	500,000
At Holland, New Jersey, 1 mill produces annually about.....	1,000,000
At Milford, New Jersey, 2 mills produce annually about.....	1,100,000
At Frenchtown, New Jersey, 2 mills produce annually about.....	1,500,000
At Erwinna, Pennsylvania, 1 mill produces annually about.....	1,000,000
At Point Pleasant, Pennsylvania, 2 mills produce annually about.....	800,000
At Lambertville, New Jersey, 1 mill produces annually about.....	600,000
At New Hope, Pennsylvania, 1 mill produces annually about.....	600,000
At Bucktail, Pennsylvania, 1 mill produces annually about.....	500,000
At Brownsburgh, Pennsylvania, 1 mill produces annually about.....	500,000
At Titusville, Pennsylvania, 1 mill produces annually about.....	800,000
At Taylorsville, Pennsylvania, 1 mill produces annually about.....	1,500,000
At Greensburgh, New Jersey, 1 mill produces annually about.....	600,000
At Trenton, New Jersey, 4 mills produce annually about.....	15,000,000
At Morrisville, Pennsylvania, 2 mills produce annually about.....	4,000,000
At Bordentown and other points below Trenton, about 1,200 rafts, containing 60,000 feet each.....	72,000,000
Total.....	113,700,000

APPENDIX C.

Stage of water above the low-water bolt-head in the "Unlashing Rock" at Lower Black's Eddy, Point Pleasant, Pennsylvania, in summer of 1872, from a record kept by the Raritan Canal officers.

Date.	Feet.	Date.	Feet.	Date.	Feet.	Date.	Feet.	Date.	Feet.	Date.	Feet.
May 21	1.0	May 31	2.0	June 29	1.8	July 9	1.2	July 18	1.0	July 27	1.6
22	1.2	June 20	1.5	July 1	1.3	10	0.9	19	1.0	29	2.3
23	1.3	21	1.4	2	1.2	11	0.9	20	1.2	30	1.6
24	1.7	22	1.2	3	0.8	12	0.8	22	0.8	31	1.1
25	2.1	24	0.8	4	0.7	13	0.7	23	0.7	Aug. 1	0.9
27	2.1	25	0.8	5	0.6	15	0.8	24	0.6	2	0.8
28	1.7	26	1.0	6	1.0	16	0.9	25	0.7	12	1.3
29	2.0	27	1.5	8	1.6	17	1.0	26	1.0	13	1.7
30	1.9	28	2.1								

NOTE.—On days between May 21 and August 13 not given, the stage was greater than two feet.

Stage of water observed by the United States survey in the Delaware River, from August 6 to October 15, 1872.

Place of observation.	Date.	Feet.	Place of observation.	Date.	Feet.
Easton, Pa.	Aug. 6 & 7	3 to 2*			
Ranbiville, Pa.	8	1.5	Lambertville, N. J.	Sept. 10	Morn. Eve'g. 0.4
Do.	9	1.1	Do.	11	0.3
Do.	10	0.9	Do.	12	0.3
Do.	11	0.9	Do.	13	0.35 0.6
Do.	12	0.8	Do.	14	1.4
Do.	13	0.8	Do.	15	
Do.	14	0.8	Do.	16	1.5
Do.	15	0.8	Do.	17	1.25
Riegelsville, Pa.	16	1.0	Do.	18	0.95
Do.	17	2.1	Yardleyville, Pa.	19	0.9
Do.	18	4.8*	Do.	20	0.6
Do.	19	4.2*	Do.	21	0.5
Do.	20	3.8*	Do.	22	
Do.	21	3.5	Do.	23	0.4
Do.	22	4.6	Do.	25	0.2
		Morn. Eve'g.	Trenton, N. J.	25	2
Tumble, N. J.	23	3.5 3.3	Do.	26	0.2 0.5
Do.	24	3.45 3.5	Do.	27	1.5 2.2*
Do.	25	3.0 2.7	Do.	28	2.0 2.1*
Do.	26	2.3 2.15	Do.	29	2.0
Do.	27	1.95 2.65	Do.	30	1.5 1.5
Do.	28	2.3 2.05	Do.	Oct. 1	1.53 1.45
Do.	29	1.8 1.7	Do.	2	1.3
Do.	30	1.7 1.65	Do.	3	1.1 1.0
Do.	31	1.7 1.7	Do.	4	1.0
Do.	Sept. 2	1.4 1.35	Do.	5	0.8
Do.	3	1.2 1.1	Easton, Pa.	8	0.4
Do.	4	0.8	Ranbiville, Pa.	9	0.3
Lambertville, N. J.	5	0.7 0.7	Lambertville, N. J.	11	0.5
Do.	6	0.57 0.55	Trenton, N. J.	12	0.7
Do.	7	0.52 0.48	Do.	14	0.6
Do.	9	0.45	Do.	15	0.6

* Rafts running down.

APPENDIX D.

*Heights along the Delaware River, referred to a datum 2.5 feet below high tide in the Atlantic.
(From Cook's Geology of New Jersey, pp. 839-846.)*

[Barometric measurements on a section from Trenton to Riegelsville.]

	Feet.
Hill one mile north of Titusville.....	459.6
Belle Mountain.....	299.9
Goat Hill.....	491.0
Academy Hill, (Lambertville).....	228.7
Holcomb's Hill, (Alexsocken Creek).....	280.6
Raven Rock, (Bull's Island Station).....	363.7
Point Pleasant.....	369.9
Trap Ridge, near Point Pleasant.....	247.7
Barrens', (summit).....	520.3
Milford Hill.....	358.6
Gravel Hill.....	824.6
Amsterdam Valley.....	307.1
Musconetcong Mountain.....	604.5
Reigelsville, (per railroad profile).....	162.9
Belvidere Railroad, at Trenton Junction.....	59.0
Belvidere Railroad, at Washington Crossing.....	64.1
Belvidere Railroad, at Lambertville.....	72.2
Belvidere Railroad, at Prallsville.....	82.5
Belvidere Railroad, at Bull's Island.....	94.5
Belvidere Railroad, at Frenchtown.....	124.6
Belvidere Railroad, at Milford.....	137.0
Belvidere Railroad, at Reigelsville.....	162.9
Belvidere Railroad, at Carpenterville.....	174.6
Belvidere Railroad, at Phillipsburgh.....	195.1
Central Railroad of New Jersey, at Phillipsburgh.....	222.6
Delaware and Raritan Canal feeder, at Trenton.....	57.0
Delaware and Raritan Canal feeder, at Lambertville.....	59.4
Delaware and Raritan Canal feeder, at Bull's Island.....	70.6

Heights on Delaware Divisional Canal above low tide at Trenton. (From United States survey of 1872.)

	Feet.
At Morrisville.....	29.0
At Yardleyville.....	41.4
At New Hope, (below locks).....	50.4
At New Hope, (above locks).....	78.4
At Point Pleasant, (above locks).....	98.8
At Riegelsville.....	149.6
At Easton level of Lehigh.....	169.5

APPENDIX E.

Bridges over the Delaware River between Easton and Trenton.

Places which the bridge connects.		When built.	Height of roadway above low water.	Number of spans.	Length of each span.	Span under which rafts pass.	Remarks.
Pennsylvania:	New Jersey:						
1 Easton.....	Phillipsburgh.....	1806	Feet. 40	3	Feet. 200	Middle.....	Wooden arch and truss.
2 do.....	do.....	1857	.....	3	170	Pennsylvania space.....	Lehigh Valley Railroad; wooden truss.
3 do.....	do.....	1865	.....	3	170	do.....	Lehigh and Susquehanna Railroad; iron truss.
4 Riegelsville.....	.....	1835	26	3	190	Middle.....	Wooden truss and arch; carried away by flood of 1841 and rebuilt.
5 Bridgton.....	.....	1842	.....	3	200	Pennsylvania space.....	Wooden truss.
6 Uhlestown.....	Frenchtown.....	18—	.....	6	156	Third from New Jersey.....	Do.
7 Point Pleasant..	.....	1853	.....	5	170	Second from New Jersey..	Wooden lattice.
8 Lumberville.....	Bull's Island.....	1854	.....	4	150	Second from Pennsylvania.	Do.
9 Centre Bridge..	Prallsville.....	1828	.....	2	Of 100	do.....	Do.
10 New Hope.....	Lambertville.....	1842	.....	4	Of 150	do.....	Do.
11 Taylorsville....	Washington Crossing	1810	.....	6	175	Third from New Jersey...	Wooden truss and arch; half destroyed by flood of 1841 & rebuilt.
12 Yardleyville....	Greensburgh.....	1830	.....	6	150	Third from New Jersey...	Wooden truss and arch; carried away by flood of 1841 and rebuilt.
13 Morrisville.....	Trenton.....	1843	.....	6	160	Third from Pennsylvania..	Wooden truss and arch; carried off in 1841 and rebuilt.
14 do.....	do.....	1861	29	7	180	Third from New Jersey...	Wooden truss.
	do.....	179—	.....	5	210	Second from New Jersey...	Wooden arch and arch; double bridge, carriage and railroad.

APPENDIX F.

Proposed line of navigation from the junction of the river Delaware with the Raritan Canal up the stream of the Delaware to the mouths of the Lehigh and Lackawaxen Creeks and thence up to the New York State line, north of Wayne County, near the forks of the Potacton and Cookquago.

"In the Delaware River there are no precipitous falls. It well accommodates a downward navigation, and this distance of its upper water can sometimes, in season of flood, be also ascended by boats. To render it passable at all times, it is proposed to clear out and deepen the natural channel, to cut down the heads of the falls and pitches, so as to make the descent more gradual and uniform; then to dam up the lakes and ponds about the tributary streams, so as to save water to be used in the dry season; and lastly, in case of necessity, to construct lateral canals at particular passes, the execution of which, it is expected, will so far improve the navigation of the Upper Delaware as to enable boats of some burden, and possibly steamboats, to navigate nearly all the summer through, quite up to the fords.

"The particulars of the existing falls, rapids, and shallows between tide-water and Easton are described from actual surveys, as follows; and in so far as they obstruct the river navigation there is reason to believe effectual improvement forthwith will be made. The States of both New Jersey and Pennsylvania are highly interested in the measure.

Name.	Distance below the mouth of the Lehigh in miles.	Length of each in feet.	Fall of each.	Head of each above tide.
			ft. in.	ft. in.
Trenton Falls.....	49	3,500	9 8	9 8
Gould's.....	46½	3,000	4 5	16 8
Scudder's Rift.....	44	2,500	4 2	24 8
Knowle's Point.....	39½	500	3 1	33 6
Bucktail Point.....	36½	500	1 5	36 5
Welle's Falls.....	35½	4,780	12 1	49 9
Greenbank Rift.....	32	500	1 9	58 9
Galloper's and Howel's Rift.....	31	1,500	7 6	68 3
Bull's Falls.....	27½	800	4 5	72 2
Custon's Rift.....	25½	1,000	3 10	85 4
Tumbledown Falls.....	24 to 25	5,000	11 1	89 1
Marshal's Rapids.....	21 to 23½	1,000	11 5	100 7
Man-of-war Rift.....	20	500	1 5	102 3
Stuhl's Falls.....	18	350	1 8	107 2
Freeman's Falls.....	17	700	3 7	110 11
Noxamixon Falls.....	14	1,700	4 11	117 6
Linn's Falls.....	12	2,300	7 4	127 0
Durham Falls.....	9½	350	2 9	130 0
Gravelly Falls.....	8	1,500	1 3	133 0
Rocky Falls.....	7	2,000	2 9	136 0
Ground-hog Rift.....	6	1,700	1 11	138 1
Old Sow.....	5	750	2 4	145 5
Clifford's.....	3½	2,000	5 1	150 10
Bixten.....	½	2,000	7 5	160 5

"In addition to which there are the following shallows, where the water, without sensible fall, has but little depth:

"Limestone Shallows, thirty-two and one-third miles below the Lehigh; they have 15 inches at low water.

"Lowerytown Shallows, sixteen and one-quarter miles below the Lehigh, formed by a sand-bar in the pool, through which a channel is cut near the Pennsylvania shore.

"Whippoorwill Shallows, two and one-half miles below the Lehigh, a small gravel-bar at head of an island, and, moreover, many shallow spots in the different pools by sand-bars or by rocks lying near the surface.

"March, 1827. A bill is now before the Pennsylvania legislature to authorize the construction of a navigable communication between Philadelphia and Easton, and by continuation to Carpenter Point, provided it shall be done in the Delaware Valley, and at a cost not exceeding \$12,000 per mile.

From "A connected view of the whole internal navigation of the United States, natural and artificial, recent and prospective, corrected and improved, &c., &c., with a map, &c., &c. By a citizen of the United States." Philadelphia, 1830. Above extract is on page 106.

APPENDIX G.

Laws of Pennsylvania concerning the navigation and improvement of the Delaware River between Easton and Trenton.

Act of March 9, 1771, (v. Laws Pennsylvania, vol. 1, p. 322,) declares that, whereas the improvement of the navigation of rivers is of great benefit to commerce, and whereas many persons have subscribed large sums of money for this purpose; therefore, &c., the Delaware and Lehigh Rivers shall be common highways for the purposes of navigation.

Twenty-six commissioners are appointed to receive subscriptions and to improve the navigation by widening, enlarging, straightening, or otherwise improving the channel.

Provides a penalty of "twenty pounds good and lawful money of this province for constructing dams to impede navigation."

Act of September 20, 1783, ratifies New Jersey act of May 27, 1783, which see, page 50.

Act of March 13, 1817, (Laws of Pennsylvania, vol. 6, p. 422,) appoints three commissioners to improve the river from Foul Rift* to the bridge at Trenton. Appropriates \$10,000 for the work.

Act of March 29, 1819, same as New Jersey act of March 1, 1820, which see, page 50.

Act of April 6, 1825, (Laws of 1825, p. 144,) authorizes the Delaware and Raritan Canal Company to supply the said canal with water from the river, provided no injury is done to either ascending or descending navigation, but reserves the right to withdraw this privilege if, in consequence, the water of the river is lowered one inch, and also provides that this privilege shall cease whenever the State of New Jersey shall refuse to grant a similar right to Pennsylvania to take the same amount of water.

Act of March 26, 1826, (Laws 1826, p. 155,) repeals last act and passes another essentially the same, except "two inches" is substituted for "one inch."

Act of April 9, 1827, (v. Laws 1827, p. 196,) provides for survey of Delaware Valley from Bristol to Carpenter's Point with a view of constructing a navigable communication, and provides that if after this survey the navigation can be built for \$12,000 per mile it shall be done, provided the existing natural navigation shall not be impaired.

Act of April 23, 1829, (Laws 1829, p. 312,) appoints three commissioners to meet commissioners from New Jersey to decide where and how water may be taken from the Delaware for canals and water-powers.

Act of April 10, 1832, (v. Laws of 1832, p. 638,) appoints three commissioners to ascertain facts about a certain dam of which complaint has been made, and to examine the river near Welle's Falls to ascertain the best way to supply the Delaware division of the Pennsylvania Canal with water.

Act of February 8, 1833, order the above commissioners how the obstructions in the river can best be obviated with regard to both navigation and the use of its waters for canal.

Act of April 20, 1846, authorizes canal commissioners to erect a dam at Welle's Falls to supply canal with water and to facilitate navigation between the outlet-locks, provided it does not interfere with the passage of fish or Durham boats, or the raft navigation. Repealed February 9, 1848.

Act of April 4, 1866, (Laws 1866, p. 436,) provides that, whereas the natural and artificial obstructions in the Delaware River above tide-water are such as to render the running of lumber in rafts to Philadelphia and other points extremely hazardous, causing every year the destruction of large quantities of the same, and thereby increasing its price in market, and whereas said river is the only outlet from the upper lumber region of the Delaware; therefore the sum of \$10,000 is appropriated to remove these obstructions, &c. I. T. Barnes, Wayne County; John Shause, Pike County; John Fisher, Bucks County, are appointed commissioners† to improve the river at such points as they may deem best to carry out the true intent of this act.

Act of March 7, 1872, (Laws, 1872, p. 259,) authorizes the Delaware and Raritan Canal Company, or their lessee, the Pennsylvania Railroad Company, to construct permanent wing-dams in the Delaware River, from the head of Bull's Island, and also from the Pennsylvania shore to the raft-channel, not exceeding 18 inches high above common low-water, and to complete and maintain the wing-dam heretofore built for the improvement of the raft navigation at Welle's Falls; also to erect such temporary structures in said channels in times of low-water as may be necessary to keep up the supply of

* Foul Rift is about twelve miles above Easton, and is a very dangerous place.

† Mr. Shause is the only one of these commissioners now living, and his address is Easton, Northampton County, Pennsylvania.

water to the canal of said company, and to maintain sufficient depth of water to enable loaded boats to cross to said canal from the Delaware Division Canal: *Provided*, That nothing in this act shall authorize the obstruction of the raft channel or interfere with the running of rafts.

*Laws of New Jersey concerning the navigation and improvement of the Delaware River between Easton and Trenton.**

Act of May 27, 1783, (see Revised Statutes, 1846, p. 41,) declares that the river Delaware, from the northwest corner of New Jersey to the place upon the said river where the circular boundary of Delaware toucheth upon the same, is, and shall continue to be and remain, a common highway, free and open for the use of both New Jersey and Pennsylvania.

Act of November 26, 1808, (see Revised Statutes, 1846, p. 480,) provides that if any person shall erect, set up, build, or maintain any wing-dam, except such as may be put up in pursuance of any special act of the legislature, or placing any other obstruction injurious to the navigation of the river Delaware, he shall be subject to the penalty of \$100.

Act of March 1, 1820, (v. Revised Statutes, 1846, p. 547,) provides that no dam, wing, or other device, creating, drawing, or using a water-power, shall hereafter be erected in the Delaware River, between New Jersey and Pennsylvania, without a view first had by three skillful and respectable freeholders in each State residing near the spot of the proposed construction; said freeholders to be appointed by the court of quarter sessions, and to report to said court. If they report favorably, and that it will not injure the navigation, the court may grant permission for the construction of the wing or dam. Penalty of not less than \$500 nor more than \$1,000 for violating the provisions of this act.

Act of February 18, 1829. (See Laws 1833, p. 246.) Whereas the waters of the river Delaware may, by a proper arrangement between the two States, be used for feeding canals and water-powers, to the great and lasting advantage of both: Therefore, *Resolved*, That three commissioners be appointed to meet a similar commission from Pennsylvania, to decide how and where the waters may be most advantageously used for these purposes, and their agreement, when duly ratified by the legislatures of both States, shall be binding and conclusive.

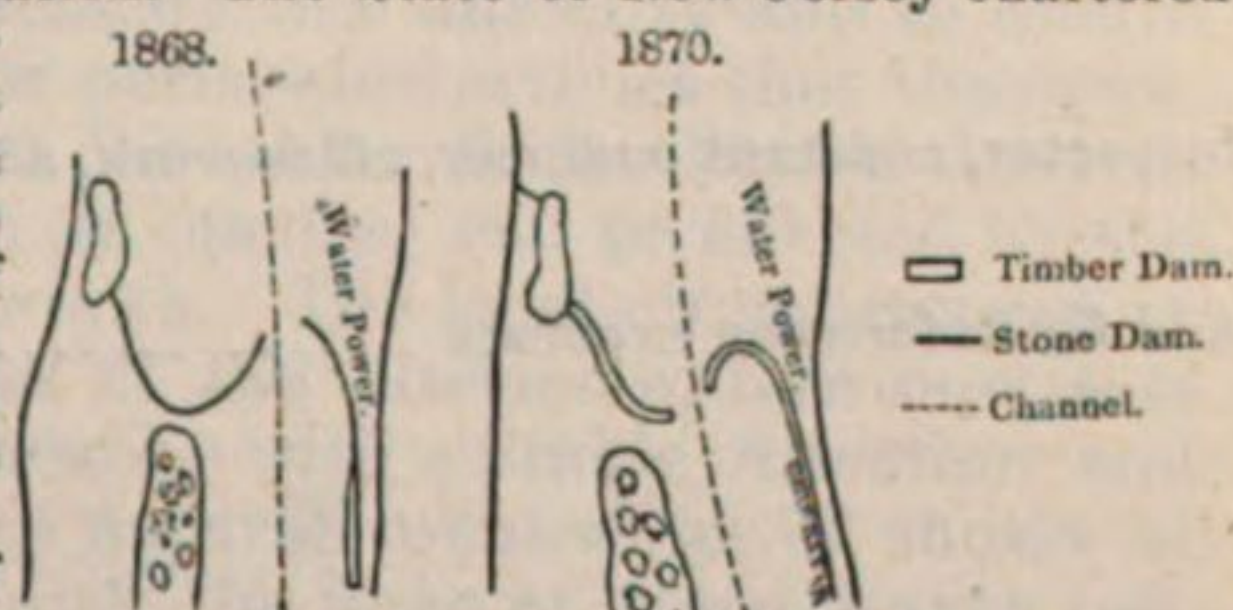
Act April 15, 1868, (See Laws 1868, p. 1036,) authorizes the Delaware and Raritan Canal Company to make such a structure as may be necessary for the protection of their feeder at Bull's Island, not exceeding 18 inches above low water, and not interfering with the raft navigation; also to complete the wing-dam at Welle's Fall for the improvement of raft navigation; also to erect temporary structures at these places in times of low water, for the protection of their feeder and the canal navigation.

APPENDIX K.

HISTORY OF SCUDDER'S FALLS.

Statement of Trenton Water-power Company.

Dams were first built at Scudder's Falls in 1819, by commissioners of State of Pennsylvania, in the sole interest of raft navigation. The State of New Jersey chartered the Trenton Water-power Company, in February 16, 1831.† Under this act the dams were still further improved, but as the chute was so near the feeder as to trouble the raftsmen, the company, under authority of the commissioners of 1866, changed it in 1869 to its present position, and replaced the stone dams with timber. This was done after full consultation with the raftsmen, and the work was superintended by one of their number, Mr. J. O. Whittaker, of Deposit, Delaware County, New York. It has proved satisfactory to them all, and is considered a perfect success. Whatever losses occur by rafts sticking on the gravel-bar below are always promptly paid by the company. In 1870, a suit was brought in



* I have been unable to obtain access to the New Jersey laws previous to 1846. The above list is therefore imperfect.

† Being unable to find access to the early laws of New Jersey, I cannot verify this statement.

the county court at Doylestown, Pennsylvania, against the company, by fishermen, who considered the change in the dam injurious to the downward passage of shad. Upon this trial the raftsmen universally testified in favor of the dam as one of the best improvements on the Delaware River. The judge, however, considered, that although the commissioners of 1866 had authorized this work, they had no right to do so, as their term of office had expired, and he hence imposed on the company a mere nominal penalty, which, however, prevents them from repairing or improving the dams.

Statements of raftsmen.

Dams were first built at Scudder's Falls about 1833, but no charter has ever been obtained authorizing their construction. They were at first of stone; but as the chute was so near the feeder, the supply of water to it (the feeder) was insufficient, and accordingly the company, in 1869, moved it to its present position, and in thus altering the natural channel, have caused great obstruction to the raft navigation. It has caused the greatest dissatisfaction, and is the source of a great yearly loss. No lumbermen, except a few particular friends of the company, have ever succeeded in getting pay for these losses. In the suit of 1870, the prosecutors undertook to prove by the raftsmen that the dam was a nuisance and an obstruction to navigation, and their universal testimony was to this effect.

The court sentenced the company to remove the dam, and ordered the sheriff to do so at their expense if the company did not do it in one month. The dam, however, is still standing, the sheriff having been "bought up" by the company.

Statements of disinterested parties.

The dams at Scudder's cause a considerable loss of young fish. The opinions of raftsmen are divided in regard to the improvement. At the trial in 1870, fifty raftsmen swore that in their opinion it was a benefit, and fifty others that it was a decided injury. Then a reserve of twenty-five followed who coincided with the first, and twenty-five more who agreed with the second opinion. The sentence of the court seems to be of the nature of an injunction restraining the company from making further improvements.

Estimate for improvement of the Delaware River between Trenton and Easton.

Ground Hog	\$2,023 31
Rocky Falls	1,446 72
Tumble	2,753 70
Welle's Falls	5,920 70
Scudder's Falls	300 00
Gould's Rift	657 50
Trenton Falls	1,610 40
Noxamixon Falls, Stuhl's Falls, Howel's Rift, Limestone Rift, and Blackguard Island	970 00
	15,682 33
Add for effect of act of May 18, 1872	3,920 00
	19,602 33
Inspector, assistant engineer, office-work, advertising, &c.	2,000 00
	21,602 33
Add for unforeseen expenses	4,320 00
	25,922 33

J. D. KURTZ,
Lieutenant-Colonel of Engineers.

UNITED STATES ENGINEER OFFICE,
Philadelphia, Pennsylvania, January 27, 1873.

V.—SURVEY FROM DELAWARE LINE TO CHINCOTEAGUE INLET, VIRGINIA, THROUGH WORCESTER COUNTY, WITH VIEW TO AN INLET AT "THE HOMMACKS."

UNITED STATES ENGINEER OFFICE,
Philadelphia, Pennsylvania, January 29, 1873.

GENERAL: I have the honor to present the following report on the survey of "the bay or sound from Delaware line through Worcester County to Chincoteague Inlet, Virginia, with a view to an inlet at or near a place called the Hommacks," provided for by "an act making appropriations for the repair, preservation, and completion of certain public works on rivers and harbors, and for other purposes," (general nature, No. 134,) and placed in my charge for execution by your instructions of June 19, 1872.

The papers accompanying this report are the detailed report of the assistant engineer in charge of the work, Mr. F. M. Eppley, with an estimate of the cost of the improvement, and the following maps forwarded by express:

Sheet No. 1. General chart of the strait at the Hommacks and adjacent region.

Sheet No. 2. Coast-Survey chart, No. 28, showing reconnaissance to Chincoteague Inlet.

Sheet No. 3. Reconnaissance at Chincoteague Inlet, 1872.

A preliminary report was transmitted by me on the 12th December, 1872.

The whole subject of the desired improvement, embracing the nature and probable cost of the works, the permanency of the inlet, if opened, the productions of the country to be benefited, and the existing disadvantages to its commerce sought to be removed, is set forth in Mr. Eppley's report.

A large body of fine white-oak forest (timber now becoming so valuable) needs to be opened to market. Square sticks, 50 feet long, and siding 2 feet by 2 feet, are not unusual in this region. Pine and cypress also are of its growth; oysters, fish, and game are in great abundance, and the whole country is rapidly becoming a part of the great market-garden of the Delaware Peninsula, to produce in profusion berries, peaches, grapes, and all vegetable supplies for the table.

The present water-outlet of this production is by Chincoteague Inlet, which is at the southern end of the bays bordering Worcester County, and the use of which route involves a loss of eighty miles to all vessels trading to northern ports. It is to remedy this difficulty and to secure a good and rapid method of transit for perishable articles that the opening of an inlet at the Hommacks from the ocean to the bays is desired.

There is reason to expect that such an opening can be effected by the proper application of the necessary works. The local circumstances of the case are favorable. The current of the interior waters now sets against the beach at the proposed locality with suitable direction and velocity. On the ocean side there is a natural breakwater of shoals at convenient distance, which will diminish the force of storm-waves rolling in to the beach. A noted case in our history of an endeavor to open an inlet through the beach to the ocean is that of Nag's Head, North Carolina. That attempt was abandoned after some considerable efforts had been made; but it appeared that since the closing of the original inlet great unfavorable changes had ensued in the waters concerned, which rendered the undertaking impracticable.

Whether the proposed opening when made will prove to be permanent is a more difficult point on which to arrive at a sure conclusion. Several inlets have been formed in the vicinity (the history of which is given by Mr. Eppley) during the past seventy years, all of which are now closed again. But these were produced by breaches of the sea, from the ocean side, and reciprocal natural influences have restored the normal condition of the shore. In the present case it is proposed to avail ourselves of the assistance of an existing favorable current derived from the water-courses of the adjacent region, and offering itself advantageously at the desired locality. It is to be considered at the same time that examples in the adjacent country of inlets subject to the influence of like currents do not present an entirely favorable condition of water-way.

Indian River Inlet, just north, is the outlet of streams draining a considerable region of country. This inlet is variable in its condition and does not at present afford much depth of channel.

Chincoteague, the present outlet of the bays under consideration, likewise varies materially in its position, the conformation of its shores, and the depth of its channels. The accompanying map of a reconnaissance of the inlet exhibits the changes.

It is to be kept in view in weighing the force of these examples, however, that the natural influences concerned have not been aided or utilized by any artificial devices. In the present case it is proposed to control and give direction to the natural flow of the bay waters by a collecting and directing dam, and also to add such works on the ocean beach as will aid in maintaining and protecting the débouché of the inlet. With these conditions all satisfied, success may be reasonably hoped for.

The effect of the opening upon the bay waters behind it requires to be considered as an important part of the question. The level of the straits at the Hommacks being about that of high water of the ocean, and the tide having a fall of three feet, it follows that at low water the surface of the bay will be three feet above that of the ocean. At present there must be a slope of the bay surface of about three feet between the Hommacks and Chincoteague Inlet, at low tide. Were the proposed inlet opened there would be a like slope toward it at low water, both from up the rivers and from down Synepuxent Bay. This slope would be subject to modification by the extent of the wing-dam proposed to be constructed in the bay. At any rate, the northern waters of Synepuxent Bay would be shoaled somewhat at low tide by the action of the inlet.

The prevalent currents on this part of our coast are shown on Sketch C, (No. 8, Progress Sketch, Section III,) of the Coast Survey Report, for 1868.

It is believed that no objection exists in the communities along the bay shores to the proposed undertaking, while generally there is a strong feeling in its favor.

The estimate of the engineer in charge would be sufficient if all circumstances prove favorable during the execution of the work. But prudence requires that in such an undertaking unfavorable influences be taken into the account. For this reason I have increased it considerably. If the work shall be executed at a less expenditure, the balance of funds will revert to the Treasury.

The cost of the survey is as follows:

Field-work, instruments, and materials.....	\$340 59
Field-work, workmanship.....	1,047 05
Office-work, services.....	610 00
Contingencies.....	173 00
	2,170 64

Very respectfully, your obedient servant,

J. D. KURTZ,
Lieutenant-Colonel of Engineers.

Brigadier-General A. A. HUMPHREYS,
Chief of Engineers United States Army, Washington, D. C.

Report of the survey of the vicinity of "The Hommocks," between Isle of Wight and Synepuxent Bays, Worcester County, Maryland, made with a view to the opening of an inlet at that locality, from the ocean to the interior waters, 1872.

PHILADELPHIA, December 27, 1872.

SIR: In obedience to your orders received by me at Philadelphia, August 28, 1872, I proceeded on the following day to Berlin, Maryland, for the purpose of making a hydrographic and topographic survey of a place called "The Hommocks," situated on the coast of Maryland, about seven miles east of Berlin, in Worcester County, and eleven miles southwest by south from Fenwick's Island light, with a view of ascertaining the feasibility of making and maintaining an inlet between the southern extremity of Isle of Wight Bay and the Atlantic Ocean.

The work covers an area of six square miles, extending from Turner's Point, in Synepuxent Bay, to Massey's Shoals, in Isle of Wight Bay, embracing the shore-lines of both bays within the prescribed limits and the ocean-beach, in all about twenty miles, together with soundings, current and tidal observations, and levels. The field-work was commenced August 30, and was completed October 21, occupying twenty-seven working days; 10,339 soundings and 1,836 hydrographic angles were taken, besides 245 angles at twenty trigonometrical points; 15 current-stations were established, and observations made for surface and sub-surface currents; six miles of level-lines were run on the beach, in sections of 100 feet, together with eight lines to determine the hill and surrounding marsh on the western shore.

The sextant was used principally in the field-work. The soundings were determined by means of the "three-point problem." A tide-gauge was erected upon our arrival, and observations commenced and continued throughout the whole work. There is very little tide at "The Hommocks," it being forty-five miles from Chincoteague Inlet. It is influenced entirely by winds, southeast bringing the highest tide. There is a variation usually of about three inches, though for days there does not seem to be an appreciable difference of all the readings of the gauge.

The greatest rise of tide was 1.5 feet. The soundings were reduced to a plane of reference in the bay, while the ocean soundings were referred to the gauge at Chincoteague Inlet.

The greatest depth of sounding inside was 13 feet; in the ocean 32 feet. They are expressed in feet upon the chart. In the current observations in the narrows, I found the general direction to be south-southeast during ebb-tide, which runs with a mean velocity of 4,673 feet per hour. With a south wind, the flood-tide flows almost due north, having a mean velocity of 2,060 feet per hour. The flood-tide is caused only by southerly winds.

The level-lines have been plotted and contours drawn showing every foot. The greatest elevation on the beach above low-water mark in the bay is 8.55'. The difference of level between bay and ocean at low-water mark is 3 feet; the bay being the highest.

A reconnaissance of Synepuxent and Assateague Bays was made, which consisted in running a line of soundings through the channels and best water in the bays, from "The Hommocks" to Chincoteague Inlet. The characteristic soundings have been laid down upon a Coast Survey chart of those bays. The average depth of water in these bays is about 4½ feet, though vessels drawing 5 feet carry oysters from abreast of Snow Hill Landing to New York and other points through Chincoteague Inlet. There are several small landings along the western shores of these bays, but they are scarcely worthy of consideration. Vessels usually load with the assistance of lighters and small boats at any point where the water is of sufficient depth to enable them to

approach near the shore. The most important articles of traffic are grain, oysters, fish, and timber. The shoalest water is on the beach or eastern side of these bays, which I think is caused by the sea washing over the beach at extremely high tides, during heavy easterly winds, carrying the sands into the bays. The western shore is marsh, covered with high grass. The eastern is the ordinary sand-beach. About eight miles of shore-lines were run at the entrance of Chincoteague and Assateague Inlets, to ascertain if any change had taken place since the survey was made by the United States Coast Survey. From my investigations, I think the mouths of both inlets have undergone great changes. Both inlets appear to be shifting to the southward, and the Middle Ground between the two inlets is making rapidly. The mouth of Assateague Inlet is much narrower than formerly. Persons living in the vicinity have readily noticed these marked changes. A large shoal is making outside, about one mile to the northward of these inlets. The channels and bars have not a fixed regimen, but usually maintain their usual depth of water on the bars, 10 feet low water on Chincoteague and 6 feet low water on Assateague. A tide-gauge was erected at Assateague Inlet and observations taken daily; mean rise and fall, 2.5 feet. Some little idea can be gained of the importance of these inlets when I state that 83 vessels, carrying 350,000 bushels of oysters and 10,000 cords of fire-wood, together with fish and grain, pass through these inlets annually.

A line of soundings was run across the mouth of Saint Martin's River, near the head of Isle of Wight Bay. The cross-section is about 3,000 feet wide, and has an average depth of $5\frac{1}{2}$ feet. The current is rather sluggish, which is no doubt caused by its being obstructed by Massey's Shoals, which lie about two miles below its mouth, extending across Isle of Wight Bay. This shoal has only about $2\frac{1}{2}$ feet water upon it; its bottom is composed of a stratum of sand about 2 feet deep, overlying soft mud.

Several inlets have broken through the beach at different points, during heavy gales. I have endeavored, as far as lay in my power, to get information concerning their history, &c.

Sandy Point Inlet opened in a June gale in the year 1821; it contained about 6 feet water on the bar, and closed in the year 1831. This inlet was situated opposite Sandy Point, about ten miles south of "The Hommocks."

Green Point Inlet opened in 1837 during a gale, and closed about seven years afterward.

Synepuxent Inlet opened about sixty or seventy years ago, and remained open till the year 1831. The above-mentioned inlets all broke through the beach within a space of three miles.

Green Run Inlet, one of the most important, remained open eight or ten years, and was navigable for vessels drawing from 4 feet to 6 feet water. It closed after shifting about one-half mile to the southward, and now, like all the others, not a vestige of it remains.

I have learned that these inlets usually shift to the southward before closing, and commence to fill up from the inside by the formation of little bars or bulk-heads across the channel-way. As they were all caused by the attack of heavy seas during gales, my impression is that they closed because the diluvial detritus of the seas was carried in on the flood-tide and lodged, as there was not sufficient ebb-tide to keep these depositions "alive."

Assawamin and Gargothly Inlets, which lie to the southward of Chincoteague, on the Virginia coast, appear to be shifting constantly. They have at times 6 feet water on the bar, while they have been known to shoal to a depth of 2 feet. There are five inlets on the Virginia coast within a space of forty miles. The country seems to be much lower than that lying to the northward of Chincoteague. The marsh extends five miles inland.

By examination of the general features of the inlets on the Virginia coast, it will be seen that they are all located at the southern extremity of bays or lagoons, and that their general direction to sea is about southeast. The proposed work, lying at the southern extremity of Isle of Wight Bay, shows our efforts to be in conformity with nature. The natural tendency or set of the current in the narrows is south-southeast, before it is deflected by striking the beach shore, and by its prolongation diagonally across the beach to sea, gives us an inlet the general direction of which could be the same as those mentioned.

The cross-section of the bay, just at the opening of the proposed inlet, contains an area of 4,876 square feet, through which the water is now flowing with a mean velocity of 1.3 feet per second. A volume of 6,338 cubic feet of water is consequently moved through said section per second.

Supposing the canal to have been opened just at high water, the water-surface of the bay and ocean would then be on the same horizontal, no particular motion being perceptible in the bay at the mouth of the inlet. As soon as the tide turns, the water from the bay commences to flow through the inlet with steadily increasing velocity and volume until the maximum of both is reached. With a fall of 3 feet between

ocean and bay, the computed maximum velocity for a canal 125 feet at the top, 100 feet at the bottom, with a depth of 6 feet and 2,400 feet long, would be, per formula:

$$\text{Velocity in feet per second} = \frac{A \times F \times 8975}{W} - .1089 = 7.6$$

A = Area in square feet.

F = Fall in feet per foot.

W = Wet perimeter in feet.

8975 = Constant quantity.

.1089 = Constant quantity.

This gives a velocity of 7.6 feet per second, and a volume of 5,130 cubic feet. This result is rather approximate, for there are many local causes which may affect this result appreciably. This would allow a surplus of 1,208 cubic feet of water to flow into Synepuxent Bay. It was the original intention to construct an inlet 200 feet wide, and 6 feet deep, but it will be seen, according to the rules of Eytelwine and Rankine, that there is not sufficient water to maintain it. The discharge is more than could be supplied by the regular flow in the bay, and that the inlet in that case would have to be 5,500 feet long, instead of 2,400 feet. By the greater length the present level of the bay would be left undisturbed, and at all times, except the period of low water, there would be a surplus of water in the bay not required for the inlet, which would find its way into the lower bay.

Freely admitting the above computations to be based upon scientific experiments, and that the velocity of water has but one law, being always proportional to the square root of its height, our judgment tells us that it does not seem possible for any practical purposes to make use of the solutions of such hydraulic problems. I do not think the velocity could increase at the rate of five miles per hour, in the short distance of 2,400 feet. The velocity must increase gradually throughout the whole bay, which can be done only by an increase of the natural slope of the water, that is to say, by augmenting the angle of declivity of the surface of the water longitudinally. Now, it is clear that the upper part of the inclined plane cannot be elevated to produce the greater fall, but that the lower part near the canal will be, naturally, by degrees, lowered to obtain the increased slope and required velocity. The level of the surface of the bay, in the vicinity of the canal, must, consequently, sink below its present line. This again will cause the difference of level between bay and ocean to be less than 3 feet, or, in other words, that part of the bay whose surface is 3 feet above low-water mark will be found a considerable distance higher up the bay than at present. It is obvious that this loss of head in the bay will in time occasion a diminishing velocity of current in the inlet. In a comparatively short time the permanent relations between bay, inlet, and ocean, will thus regulate themselves. The increased velocity of current in the bay will have a scouring action on the bed, gradually deepening it toward the inlet, thus preparing a bed of easier slope, creating in fact, by degrees, a channel, the length of which, in relation to its fall, will finally harmonize the capacity of the Isle of Wight Bay for supply with the demands of the inlet for discharge. It is clear that the opening of the inlet will cause a much more sluggish motion of the currents in Synepuxent Bay, which will increase the shoaling of the whole bay. As this process is going on, the tendency will be to widen and deepen the inlet, which points out the necessity of a careful construction of the banks of the inlet, particularly the upper and lower ends. The mouth of the inlet or point of junction with bay or ocean should be enlarged as per diagram, giving it at that point the shape of a contracted vein. Without such enlargement a slight fall will form itself at its mouth, beyond that which the canal was intended, and will diminish the calculated depth throughout its entire length to an amount equal to the fall. The currents of the inlet will most probably prevent any formation of bars or shoals at its mouth on the ocean side; besides, we have the advantage of two large shoals, known as "Great and Little Gull Banks." Little Gull Bank lies about two miles to the eastward of the work, and contains only 12 feet water at some places. A heavy sea will break in 12 feet water, and, as the breaking will arrest the force of heavy seas during gales from the eastward, we will have comparatively smooth water at the mouth of the inlet. Besides, the southerly current, according to observations of the United States Coast Survey, flows nearly due north, striking the shore several miles below the inlet. It is then deflected and flows northeast through the sound made by the Gull Banks and the shore, cutting across the mouth of the inlet with increased velocity.

A jetty 1,000 feet long should be constructed, about 650 feet to the southward of the mouth of the inlet, extending to the 15-foot curve, as per diagram. This would protect its mouth from the southeasterly gales and the abrading influences of the southerly currents, for it will be seen that the ocean-beach is cutting away in the vicinity of the inlet. The northerly current sets at southwest; consequently we are protected by the Gull Bank Shoals.

In the construction of the proposed work the axis of the inlet should strike the point

immediately where the channel makes an elbow in the narrows, and prolonging the set of the ebb-current diagonally across the beach to the ocean in the direction of south-southeast.

The width should not be less than 125 feet, and 6 feet deep. A canal of less width would not allow small vessels to beat against head-winds. Particular attention should be paid to the embankments, which should be high enough to protect the inlet from inundations during heavy easterly gales, when the breakers wash across the whole beach. The best plan for an embankment would be to drive piling 15 feet below the water-line at a distance of 20 feet apart, connect them with strong pieces, which should then be overhung with bushes and aquatic grass to encourage its growth upon the banks. The soft strata found in the dredging should be overlaid upon the structure, the embankment to have a slope of 45° .

A wing-dam in the bay is necessary to force the water through the new channel. This could be made of sheet-piles driven to a depth of 6 feet, having 2 feet extant, the whole to be connected with wales. This structure should be 950 feet long, and to run parallel to the direction of the inlet, commencing 250 feet to the southward of its mouth.

The work involves a considerable amount of dredging or removal of sand in making the cut between the bay and ocean. This could be done at an average cost of 40 cents per yard. A dredge could be built on the ground at a cost of \$10,000 that would remove from 200 to 300 cubic yards daily.

I think the cheapest and most feasible channel to dredge through Massey's Shoals would be to connect the 5-foot curve in the bay with the deep water in the "Thoroughfare." As I have already said, I think this shoal will have a greater depth of water after the opening of the inlet, but in case it does not, the dredging of this shoal is indispensable, for without a channel of 5 feet from the inlet into Saint Martin's River the work would be of little consequence.

The turning of the water of the Pocomoke River into the Saint Martin's River would help to deepen the water in this shoal materially.

For a number of years the people of Worcester County have conceived the idea of uniting the waters of Pocomoke River with the Saint Martin's, in connection with the construction of an inlet and the drainage of a vast area of country. In the year 1856 Colonel C. W. Jacobs, of Worcester County, secured the services of an engineer, who made a reconnaissance of the country lying between the two rivers. A line of levels was run, and a fall of 27 feet was found in five and five-eighths miles, the distance between the two rivers. He reported favorably upon the works, and proposed to cut a ditch 15 feet wide and 6 feet deep. This canal, with a fall of $4\frac{1}{2}$ feet to the mile, would give an increased volume of water in the Saint Martin's River amounting to 372 cubic feet per second.

I now insert Mr. Jacobs' opinion upon the subject:

"If, in connection with the inlet, a canal was cut across from the upper end of the Pocomoke River into Saint Martin's River there would be no lack of water, and the work would be permanent. It would only require between five or six miles of cutting, at an expense of about \$25,000. If this canal was cut, it would reclaim an area of at least 60,000 acres of land, now in a low swampy state. The Cedar Swamp lying in lower Delaware, and joining the Maryland line, contains 22,000 acres of land, and the numerous ditches running up in westerly direction must drain 22,000 acres more, while the bed of the river and the intervening country between the two rivers would drain at least 16,000 acres more. I have always regarded the two enterprises as essential to the permanency of an inlet."

Whether it would successfully drain the country is a question somewhat in doubt. Several years ago this was successfully done in New Jersey by the Salem Creek and Meadow Company, by uniting the Salem River with the Delaware by means of a ditch three and a half miles long. Two years after drainage, potatoes were raised on lands previously submerged. The two sections above and below this canal are nearly the same breadth. The estimate of the engineer for the cost of this work will accompany this report.

Estimate for construction of inlet.

93,000 cubic yards excavation, at 40 cents per yard.....	\$37,200 00
For stone jettee outside, 1,000 feet long, 3,787 perches stone, at \$4 per perch.	15,148 00
Wing-dams, sheet-piling 950 feet long, at \$2 per foot.....	1,900 00
Construction and embankments.....	1,800 00
Dredging Massey's Shoals, 13,333 cubic yards, at 35 cents per yard	4,666 55
Salary of engineer and incidental expenses	2,000 00
Total.....	<u>62,714 55</u>

Estimate of Peter Sowers, civil engineer, for cutting ditch to unite the Pocomoke and Saint Martin's Rivers.

189,340 cubic yards, at 9 cents per yard.....	\$17,040 60
Clearing and grubbing.....	3,000 00
Total.....	<u>20,040 60</u>

I will now endeavor to give an idea of the advantages that may arise by the construction of this inlet. Many things could be said in its favor, and it would undoubtedly be of incalculable value to the people of Worcester and Wicomico Counties. Whether it would be of sufficient importance to a large community, so as to make it a national project, is a question. There are several points within thirty miles of the proposed work which seem to have very good water communication with Baltimore via Chesapeake Bay. Snow Hill, a thrifty little town lying about twenty miles southwest, is situated on the Pocomoke River. Vessels drawing 6 feet have no difficulty in landing their cargoes on her wharves after a passage of about forty-five miles up the Pocomoke.

Saulsbury, a town on the Wicomico River, has also good communication with Baltimore. It would seem from this that an inlet is not necessary; but there is one important difficulty, viz: water communication with New York and Philadelphia. A glance at the map will show that vessels bound to Philadelphia or New York from either of the above-named places will be compelled to run a distance of nearly two hundred miles around Cape Charles before they come abreast of the inlet, showing a saving of thirty hours, allowing vessels to have fair winds. Another important fact is that there is no inlet between Chincoteague and Indian River, Delaware, a distance of over seventy miles, while on the Virginia coast they have five within a space of forty miles.

The most important feature of the inlet would be the development of immense tracts of woodland, composed principally of white oak. Fire-wood is scarcely worth cutting, simply because they have no means of transporting it. This section of country is especially adapted to the raising of fruit, as it matures very early there. By the introduction of salt water into the Isle of Wight Bay through the inlet, it would have a tendency to allay the malarial disease arising from fresh-water marshes and lowlands.

Isle of Wight Bay would become one vast oyster-bed, affording the markets of New York and Philadelphia a ready supply. It would also promote a long talked of enterprise of building hotels and summer resorts on the beach. In fact it would open up a country which is at present almost entirely undeveloped.

Small vessels are frequently wrecked in this vicinity owing to the want of a harbor for protection. In this case we gain another advantage by the competition of this proposed work. I will now append extracts of a letter upon this subject from one of the prominent men of Worcester County.

"This is one of the largest counties in the State, peculiarly located and abounding in resources far superior to any other section of our State. It has Delaware on the north, Virginia is on the south, and the Atlantic Ocean on the east, with an inland bay divided from the ocean by a narrow strip of beach running its whole length from Delaware to Virginia.

"This inland bay is a broad sheet of shallow water, varying from two to seven miles wide, fed by numerous streams putting up into the main-land, all abounding with variety of fish for this latitude, and the bay thoroughly bedded with oysters surpassing the celebrated York River and Lynn Haven oysters of Virginia. This is not all. Our country has a soil unsurpassed in fertility, and yet studded by primeval forests of immense growth, all of which is to us and the outside world of comparatively no value, simply for want of an inlet."

The following is an accurate estimate of the resources of the country which would be developed by the construction of this inlet; it was carefully prepared by some of the most reliable gentlemen of Worcester County:

Estimate.

Six thousand acres white-oak timber, averaging 10,000 feet, 60,000,000. Fifteen thousand acres pine timber, averaging 20,000 feet, 300,000,000. Two thousand five hundred acres cord-wood timber, averaging 40 cords, 1,000,000. Three hundred thousand bushels grain. One hundred vessels wrecked last twenty years; average value \$20,000 each.

Fifty square miles oystering-grounds where the water is now fresh, will be made salt by proposed inlet.

Advantages to fruit and trucking incalculable.

Advantages in shipping stock,

One hundred and twenty miles saved in distance to New York by inlet over present route.

I take pleasure in returning my thanks to Messrs. Kennedy and Mackall for their intelligent co-operation in the work.

I have the honor to be, your most obedient servant,

F. M. EPPLEY,
United States Assistant Engineer.

Colonel JOHN D. KURTZ,
United States Army, Corps of Engineers.

Estimate of the cost of opening an inlet at the Hommocks, Worcester County, Maryland.

Channel through beach :	
Dredging a cut 2,000 feet by 7 feet deep, and 250 feet wide, from the bay to the ocean, 150,000 cubic yards, at 50 cents.....	\$75,000
Wing-dam :	
260 piles driven, at \$3 each.....	780
Jettée on beach :	
1,680 logs, round timber.....	\$2,325
3,000 cubic yards stone.....	24,000
Iron-work and labor on grillage.....	3,500
Superintendence, advertising, office-work, and contingent expenses.....	29,825
	7,000
	112,605
Add for unforeseen expenses.....	8,000
	120,605

NOTE.—This estimate is at full quantities and prices, to cover unfavorable circumstances. If these should not occur there will be a reduction in the expenditure.

J. D. KURTZ,
Lieutenant-Colonel of Engineers.

UNITED STATES ENGINEER OFFICE,
Philadelphia, Pennsylvania, January 29, 1873.

VI.—EXAMINATION AND SURVEY OF HARBORS OF WASHINGTON AND EDENTON, AND MOUTH OF MACKAY'S CREEK, NORTH CAROLINA.

UNITED STATES ENGINEER OFFICE,
Baltimore, Maryland, December 31, 1872.

GENERAL: The appropriation bill of June 10, 1872, contained directions for surveys or examinations at three localities in North Carolina, viz, the harbors of Washington and Edenton, and the mouth of Mackay's Creek.

But little field-work was needed, as existing Coast Survey sketches furnished nearly all the information required to indicate the character of the obstructions to navigation, and provided much of the data upon which to base estimates of the cost of improvement. Such re-examination as was found to be necessary was made by Assistant Engineer George H. Elliott, at Edenton, in August, 1872, and at Washington and Mackay's Creek, in October, 1872. His reports are submitted herewith, one for each place; those for Edenton and Mackay's Creek being dated December 17, and that for Washington being dated December 18, 1872. Each is accompanied by a sketch, marked respectively, E, M, and W.

A communication from the United States collector at Edenton, dated November 22, is inclosed, as is also a brief letter from the deputy col-

lector at Washington, the two giving statistical information concerning the commerce of the three places.

For a description of these localities, their resources and capabilities, reference is requested to Mr. Elliott's reports, which are sufficiently full of information to enable Congress to decide as to the propriety of making appropriations for the improvement desired by the inhabitants. It cannot be doubted that such improvement would tend greatly to the development of trade and industrial enterprises, and contribute to the general good of that section of the country.

The improvement proposed for Mackay's Creek consists of the removal of the wreck of a small schooner, and the dredging of a channel 60 feet wide, to a depth of 7 feet, from the mouth of the creek out, until the same depth is reached in the sound, at a cost of about \$5,000.

The proper improvement for Edenton seems to be the excavation of a channel 100 feet wide and 9 feet deep, from the town to the deep water of the bay, at a cost of about \$10,000.

The obstructions to navigation near Washington, partly natural and partly artificial, are more serious than at Edenton or Mackay's Creek, owing to their extent and the cost of remedying the difficulties caused by them. Mr. Elliott's estimate contemplates the removal of 2,500 piles, sunken logs, dredging and the construction of a long dike for contracting the too broad water-way below the town, and directing the flow of the water into the dredged channel of 9 feet in depth. The cost is stated to be about \$35,000.

It is desirable for economical considerations that the whole sum be at once appropriated, in order that all the parts of the improvement may be simultaneously executed. Any smaller sum can, however, be advantageously expended.

The soundings in the sketch of Edenton Bay are all new; that of Washington is a tracing from the last Coast Survey sketch, no material change having taken place since it was made, 1872.

The sketch of Mackay's Creek contains a few new soundings, showing changes near the mouth of the creek.

The latest Coast Survey sketches of the localities are inclosed for comparison, if desired, with those now furnished.

Respectfully submitted.

WM. P. CRAIGHILL,
Major of Engineers.

Brigadier-General A. A. HUMPHREYS,
Chief of Engineers U. S. Army, Washington, D. C.

WASHINGTON HARBOR, NORTH CAROLINA.

FORT MONROE, December 18, 1872.

COLONEL: In compliance with your instructions, I have the honor to submit a report on the examination of Washington Harbor, North Carolina, made under your direction, in the month of October, 1872.

Washington, the county seat of Beaufort, is situated on the Pamlico River, some thirty miles from its mouth, where it empties into Pamlico Sound. It is the largest and most important town in this section of the State, its population being about 3,500, and it supplies the whole of the back country, for a distance of some twenty miles, in the direction of Plymouth, and for considerable distances in other directions.

The Pamlico River is known above Washington as the Tar River, and is the western boundary of the peninsula, of which the Roanoke River is the eastern. This peninsula is a section of country of great fertility, producing large quantities of grain and cotton, which are shipped on the two rivers named.

The Tar is navigable, during portions of the year, for light-draught vessels, to Tar-

borough, which is the terminus of a branch of the Wilmington and Weldon Railroad. Much of the cotton, &c., raised, is shipped, and a considerable portion of the merchandise purchased north, by the merchants of Washington, is brought down by this route, but the people complain that the rates of freight are very high, and that business is cramped in consequence, and state that if there were a channel of sufficient depth up to the town, they would soon have direct trade with New York and other northern cities, as was the case some years previous to the war.

As stated in a report on the Roanoke River, the Jamesville and Washington Railroad and Lumber Company have constructed a railroad from Jamesville, on the Roanoke, to their mills, about half the distance to Washington, and it is expected that it will be completed through, in the course of a year or two. A proposed southern air-line railroad also passes through Washington. I was promised, by a well-informed gentleman in Washington, full statistics of the productions of, and shipments from, the country in the vicinity of the place, but as yet they have not been received.

From the report of the deputy collector of customs, herewith, it appears that the total tonnage belonging to, and running from, Washington, for the past year, was about 1, 125; this statement, however, gives no adequate idea of the shipments, as there are now several steamers belonging to other places, which come there regularly, one of which runs weekly from Norfolk, and brings back, during the season, some 300 bales of cotton each trip.

The obstructions to navigation in the harbor of Washington, and in the river for some miles below the town, are shoal water, logs, and pile obstructions.

The shoal water may be attributed to the sudden widening of the river, by which the velocity of the current is reduced, and its scouring effect on the loose sand forming the bottom weakened. This can only be remedied by the construction of a dike, or dikes, to contract the channel for some distance down. A dike is indicated in blue on the sketch herewith.

The logs can be pulled out by proper machinery.

The pile obstructions consist of four rows, driven in pairs, with an interval of about 150 yards between each pair, and six and one-half miles below the town. In all 2,700 were driven entirely across the river, diagonally, at High Point. They were driven early in the war, by the confederates, and after penetrating the bottom as far as they could be made to, were sawed off 3 feet below the surface of the water. Of these piles enough have been removed to leave a passage 100 feet wide, about 250 yards from the east shore. This opening is buoyed at each corner. It is estimated that 2,500 of these piles still remain, and if it is contemplated to open the river for sailing-vessels, they should all be removed. An estimate of the cost of the improvements mentioned is submitted, should the importance of the place warrant the expenditure.

Estimate.

For 7, 100 linear feet dike, at \$2.....	\$14, 200 00
For dredging 4,000 cubic yards, at \$1.....	4, 000 00
For removing logs.....	1, 000 00
For machinery and labor to remove 2,500 piles	12, 500 00
	31, 700 00
Add 10 per cent. for contingencies	3, 170 00
	34, 870 00

Very respectfully submitted.

GEORGE H. ELLIOTT.

Colonel WM. P. CRAIGHILL,
Corps of Engineers, Baltimore, Maryland.

EDENTON HARBOR, NORTH CAROLINA.

FORT MONROE, VIRGINIA, *December 17, 1872.*

COLONEL: In compliance with your instructions, I have the honor to submit report on the survey of Edenton Bay, North Carolina, made under directions, from August 27 to August 30, 1872.

A preliminary examination of the locality showed that only a limited portion of the bay needed improvement, and to that portion the survey was confined.

Edenton, the county-seat of Chowan, is situated at the head of the bay, which is the northwestern extremity of Albemarle Sound, and immediately at the mouth of Chowan River. It is a town of considerable importance, having a population of upward of 1,000, and is the shipping point of a large area of the county. No manufactures are at

present carried on, although some years previous to the war there were two marine railways, which, I am informed, were in active operation. Sailing-vessels were then built for the West India trade, which is stated to have been, at that time, very considerable. The decay of this branch of industry and trade is, by the people of Edenton, attributed to the filling up of the bay, which rendered it very difficult, if not impossible, for vessels of the necessary draught of water to get up to the town. Judging by the Coast Survey charts, this filling up must have occurred a long time previous to the war.

The country adjacent to the town is not generally adapted to the growth of cereals, the soil being light and sandy, but especially suitable for the production of cotton and garden truck, of which large quantities are shipped annually. In the neighboring swamps and woods railroad-ties of cypress and oak, and shingles, are gotten out in considerable quantities and shipped.

On the shores of the sound and rivers in the vicinity are very extensive fisheries, some of the seines in use exceeding a mile in length.

It is estimated by a competent judge that the total value of all the shipments from Edenton in the past year is not less than \$500,000, and during the same period merchandise of various kinds was brought from the North and from foreign ports to the amount of \$300,000. In this trade quite a number of vessels, generally steamers, are engaged, the total tonnage registered at the custom-house during the last year being 75,000. In addition many vessels which stop to land or receive cargo and proceed, do not enter or clear.

The steamers run from both Baltimore and Norfolk, and pass through the Albemarle and Chesapeake Canal. There is also a steamer (side-wheel) of considerable size, which runs tri-weekly, carrying the United States mail from Franklin, on the Seaboard and Roanoke Railroad, down the Blackwater and Chowan Rivers to Edenton and Plymouth. This steamer, when fully loaded, has a draught of water of $8\frac{1}{2}$ feet, and in approaching Edenton she often has to plow her way through the sand, and not unfrequently gets aground.

As will be seen by reference to the map of the portion of the bay surveyed, herewith, the depth of water in the channel for nearly half a mile from the town does not exceed 8 feet, and in some places is only $6\frac{1}{2}$ feet. It is reported by old pilots in the neighborhood that within their recollection there was a depth of over 10 feet the whole distance. This must have been a very long time ago, for, by reference to the Coast Survey chart of 1849, it will be perceived that the channel, both as regards position and depth, has changed but slightly from that time to the present.

The trade of Edenton and the surrounding country would, no doubt, be materially benefited by an increased depth of water, and the maximum that can be used at present is fixed by the depth which can be carried over Hatteras Bar. This is now from $8\frac{1}{2}$ to 9 feet.

Should the importance of the place, in the opinion of Congress, warrant it, the improvement I would propose is the dredging of a channel 100 feet wide to a depth of 9 feet, from the town out, until that depth is reached. Such a channel is indicated on the map. The excavation necessary, including the dredging of a portion of the dock, will amount to 15,000 cubic yards. An estimate of its cost is submitted herewith. The bottom in the channel is generally of hard sand, mixed to some extent with mud, and it is probable that an excavated channel would maintain its stability for a considerable length of time.

Estimate.

For dredging to make a channel 100 feet wide and 9 feet deep, from the dock out until that depth is reached, and for dredging the dock, 15,000 cubic yards, at 60 cents	\$9,000
Add 10 per cent. for contingencies	900
	9,900

Very respectfully submitted.

GEO. H. ELLIOTT.

Colonel WM. P. CRAIGHILL,
Corps of Engineers, Baltimore, Maryland.

MOUTH OF MACKAY'S CREEK, NORTH CAROLINA.

FORT MONROE, VIRGINIA, *December 17, 1872.*

COLONEL: In compliance with your instructions, I have the honor to submit report on the examination of the mouth of Mackay's Creek, North Carolina, made, under your directions, on the 31st of October, 1872.

Mackay's Creek is a deep and narrow stream, navigable for some ten or twelve miles from its mouth, in Washington County. Its immediate course is through valuable swamp-lands, which have not been worked for lack of transportation. The neighboring country is of the same character as is generally found through this section of the State, the soil being light and sandy, and the principal production cotton. Of this staple, it is estimated, about 1,000 bales are annually raised within a radius of a few miles from what is known as Mackay's Ferry, which is now a draw-bridge, about half a mile from the mouth of the creek. This cotton has generally to be hauled to Plymouth for shipment, a distance of six or seven miles from the bridge, entailing considerable expense to the producer.

There is a saw-mill located at the bridge, producing from 6,000 to 8,000 feet of lumber daily, the greater portion of which is shipped North.

I was informed by a gentleman in Plymouth, who owns large swamps in the vicinity of the creek, that if it were opened, so that transportation were to be depended upon regularly, he would get out from his swamps from four to five million of shingles.

The improvement contemplated would make a nearer and more convenient shipping point for an extensive and important section of country, enabling the citizens to receive their supplies and ship their productions by the steamers which ply on Albemarle Sound, immediately on the creek, instead of hauling them to and from Plymouth.

Mackay's Creek empties into Albemarle Sound on the south side, about nine miles east of Roanoke light-house, and as there is an ample depth of water in it, the only improvement needed is the deepening of the channel from its mouth out until the desired depth of water is reached in the sound.

There is a small schooner sunk inside the creek, belonging to parties in Beaufort, North Carolina, which, however, could easily be removed at a very small cost.

Should the importance of the place justify the expenditure, the improvement proposed is the dredging of the present channel for a width of 60 feet, to a depth of 7 feet, from the mouth of the creek out, until that depth is reached in the sound.

It is not expected that this improvement will be permanent in its character, but as the bottom, where it is proposed to dredge, is hard sand, it will probably last for some time, and if, as is expected, many steamers pass this dredged channel, the tendency will be to keep it open.

Estimate

For dredging to make a channel 60 feet wide and 7 feet deep, from the mouth of the creek until that depth is reached in the sound, 6,500 cubic yards, at 60 cents.....	\$3, 900
Add 10 per cent. for contingencies, &c	390
	4, 290

Very respectfully submitted.

GEO. H. ELLIOTT.

Colonel WILLIAM P. CRAIGHILL,
Corps of Engineers, Baltimore, Maryland.

CUSTOM-HOUSE, EDENTON, NORTH CAROLINA,
November 22, 1872.

SIR: In reply to your letter of the 16th instant, I have the honor to furnish the following report upon such facts as bear upon the contemplated improvement of Edenton Bay and Mackay's Creek.

It would undoubtedly be of great benefit to the shipping and commercial interests of Edenton and the surrounding country to have the channel in Edenton Bay widened and deepened, and such obstructions removed as at present render its navigation difficult, and, in some instances, perhaps, hazardous. During the previous year the tonnage of steam and sail vessels entering and clearing from this port amounts to 75,000 tons. Besides these there have been a number of vessels touching at this port, without sufficient merchandise to require them to enter or clear. Edenton Bay is a safe and commodious harbor for vessels plying the Albemarle Sound and the Roanoke and Chowan Rivers.

In order to give you an idea of the amount of commerce carried on from this port, I would respectfully state that, from the most reliable and authentic sources, it is ascertained that the exports to foreign and northern markets of domestic produce, such as cotton, corn, peas, lumber, shingles, fish, and garden truck, will, no doubt, approximate the sum of \$500,000.

The imports of merchandise from foreign ports, the northern cities, the Virginia and Maryland markets, will estimate, on a low calculation, the sum of \$300,000.

Mackay's Creek, in Washington County, is an important point, and the improvement contemplated there will be advantageous to the shipping and commercial interests of that section, furnishing for the population of that county and the surrounding counties, in many instances, a more convenient and expeditious shipping point than Plymouth. We may also consider the vast amount of timber and shingles which would be more easily accessible if the improvement is made as designed. Mackay's Creek is situated in a fine agricultural section.

These facts embrace the most important information bearing upon the contemplated improvements of Edenton Bay and Mackay's Creek, while there may be other considerations of minor importance to show the necessity and advantage of the improvements.

Should you desire any additional information on the subject, it will afford me pleasure to furnish it, if in my power.

Very respectfully, your obedient servant,

CHARLES G. MANNING,
Collector.

Mr. GEORGE H. ELLIOTT,
United States Engineer Office, Fort Monroe, Virginia.

CUSTOM-HOUSE, WASHINGTON, NORTH CAROLINA,
December 5, 1872.

Hon. GEORGE H. ELLIOTT, *Fort Monroe, Virginia:*

Your letter came safe to hand, and I am sorry I have been forced to delay, as I did not have my records to hand, and at this, my first chance, reply. The tons belonging and running to and from this (Washington) subdivision of collector's district of Pamlico, North Carolina, is about 1,125. Sorry I could not answer sooner.

I am yours, truly,

J. B. RESPESS,
Deputy Collector and Inspector.

VII.—WAUKEGAN HARBOR, ILLINOIS.

UNITED STATES ENGINEER OFFICE,
Chicago, Illinois, January 2, 1873.

GENERAL: I have the honor to submit herewith the accompanying report of an examination of Waukegan Harbor, Illinois, called for by the act of Congress approved June 10, 1872.

There is no harbor whatever at this point. A small creek empties into the lake, but has no value for harbor purposes. A harbor at Waukegan must be entirely artificial.

There are no natural features which would suggest a harbor at this place. Its commerce has been carried on from bridge-piers in the open lake. An attempt was made to construct a harbor at Waukegan in 1855. The plan was a breakwater parallel to the shore, covering the heads of the bridge-piers. It appears that one crib 30 feet long and 25 feet wide was placed in position. This was afterwards carried away by a storm. Since that time nothing has been done. A survey of the lake, in the vicinity of Waukegan, was made, under the direction of Colonel Graham, in 1855. A copy of the map of this survey accompanies this report, and the soundings taken the past season are plotted on it, so as to show the changes which have taken place. It appears that the shore-line has advanced about 23 feet, and that the depth of water is less than in 1855. This is due to the drift of sand and shingle, which takes place constantly along the southern end of Lake Michigan, and is caused by northeast storms.

The local commerce of Waukegan, as set forth in the accompanying report, does not warrant any expenditure by the Government for a harbor at this locality.

A harbor of refuge, however, affording easy access to vessels of all classes would be of great benefit to commerce. The nearest harbors are Chicago, thirty-six miles south, and Kenosha, sixteen miles north. The latter harbor is not at present deep enough to admit vessels of the largest class, and the nearest harbor north, affording security to vessels of all classes, is Milwaukee, which is about fifty miles north of Waukegan. There is thus a length of coast of eighty-six miles, where vessels of the larger class can find no harbor. It does not follow that Waukegan is the best point for such a harbor. Should it be thought that a harbor of refuge is needed in this part of the lake an examination should be made of the coast for the purpose of selecting the most suitable location.

A plan for an outside harbor is indicated on the accompanying map. It consists of a breakwater 2,000 feet in length, placed nearly parallel to the shore, and two piers. The north pier connects the northern end of the breakwater with the shore. The south pier connects a point 500 feet south of the southern end of the breakwater with the shore, so as to leave an entrance to the harbor 500 feet wide. As there is no sheltered place for constructing cribs in the vicinity, it is proposed to obtain shelter by constructing the pier marked A B, and dredge out the bed of the stream, to make a basin of sufficient width and depth for the purpose. This pier may be built of piles, and need not exceed 700 feet in length. The construction of this pier, and the same length of the south pier, with the excavation of the bed of the stream, would afford a harbor sufficient for all local purposes at a cost of about \$75,000.

In constructing this harbor the first thing to be done is to put in the two piers A B and C D, which should be pile-piers. As soon as the piers are extended out to about 8 feet depth of water the dredging of the channel should be commenced. The dredging and pier extension should then be carried on until the room required for constructing cribs for the breakwater is obtained. The breakwater and piers in depth of water greater than 16 feet should be of cribs 50 feet long and 30 feet wide; in less than 16 feet depth, and over 12 feet, 50 feet long and 20 feet wide. The piers inside of the 12-foot curve should be of pile-piers, as adopted at other harbors.

The estimated cost of the harbor is as follows:

17 cribs, 50 feet by 20 feet, at \$300	\$51, 000
85 cribs, 50 feet by 30 feet, at \$700 ..	595, 000
2,250 feet pile-pier, at \$30 per running foot	67, 500
100,000 cubic yards of dredging, at 30 cents.....	30, 000
	743, 500
Add 10 per cent. for contingencies.	74, 350
	817, 850

I am, general, very respectfully, your obedient servant,

D. C. HOUSTON,

Major of Engineers, United States Army.

Brigadier-General A. A. HUMPHREYS,

Chief of Engineers, U. S. A., Washington, D. C.

UNITED STATES ENGINEER OFFICE,
Chicago, Illinois, December 14, 1872.

MAJOR: I have the honor to submit herewith my report on the survey of Waukegan Harbor, Illinois.

In pursuance with written instructions, received and dated July 1, 1872, I proceeded to Waukegan, Illinois, after the close of my survey at Pensaukie, Wisconsin, arriving there on the 31st of July, 1872.

Waukegan is situated on the west shore of Lake Michigan, thirty-six miles north from Chicago, and is mostly built on land having an elevation of from 40 to 60 feet above the lake; it contains a population of about five thousand. It has nine churches, five school-houses, two flouring-mills, two planing-mills, three tanneries, one post-office, five hotels, and one court-house.

There is a small creek that runs through the southern portion of the city, and empties into the lake, which was much larger than at present, but is now almost extinct, the average depth of which will not exceed 18 inches during the summer,

Present improvement.—This consists of a bridge-pier which was built over eighteen years ago. It extends into Lake Michigan to a depth of 12 feet, and is 700 feet in length, 500 feet extending into the lake beyond the shore-line. This pier, which is in a very dilapidated condition, is all the facility afforded for the shipping interest, and at present is adequate for the amount of commerce carried on. All the shipping at this point is done over this pier, which is maintained by private enterprise, and is exposed to the inconvenience of wind and sea. At some seasons of the year no landing can be made. The only business of any consequence done over this pier is lumber, which is received, there not being any exports made by water.

The character of the lake-bottom is sand at a depth of 17 feet; from that depth out it is mostly clay and loose stone, affording good holding-ground. Soundings were taken and examinations of the lake-bottom made out to the depth of 25 feet.

The benefits to be derived from making a harbor at this place will be entirely local. There is no apparent necessity for a harbor in this locality, as vessels can ride at anchor during the heaviest storms, besides which Kenosha Harbor, sixteen miles north, affords a good harbor with 8 feet depth of water.

The nearest harbor south is Chicago, thirty-six miles distant, and there is no harbor between Chicago and Milwaukee that vessels drawing over 10 feet can enter, Milwaukee being fifty miles north, leaving then eighty-six miles of coast which affords no shelter during heavy storms to the large class of the fleet which frequent this locality.

The large expenditure necessary for the improvement and construction of a harbor at this point, owing to the very light commerce, would make it impracticable, and the demands of the place would not sufficiently warrant any large expenditure, though the improvement of this harbor in some manner might be of great benefit to commerce in general.

All the grain shipped, and other mercantile business which is carried on, is done over the Chicago and Northwestern Railroad, which runs directly through the place and apparently supplies all commercial demands.

Waukegan is included in the collection district of Chicago, which is the nearest port of entry. The nearest light-house north is at Kenosha, sixteen miles distant.

In taking the soundings two instruments were used, one of which was in charge of Assistant G. A. M. Liljecrantz; in this manner each sounding was located accurately.

The receipts for the year ending December 31, 1871, are as follows: Lumber 5,000,000 feet; bark 700 cords.

The number of arrivals and departures of vessels was 50.

I am, major, very respectfully, your obedient servant,

WILLIAM J. BRYSON,
Assistant Engineer.

Major D. C. HOUSTON,
Corps of Engineers, U. S. A., Chicago, Illinois.

VIII.—SURVEY OF PENSUKIE RIVER, WISCONSIN.

UNITED STATES ENGINEER OFFICE,
Chicago, Illinois, January 7, 1873.

GENERAL: I have the honor to submit the accompanying report of a survey of the Pensaukie River, Wisconsin.

The Pensaukie River empties into Green Bay about twenty-five miles from the mouth of the Fox River, on the west side of the bay. There are three saw-mills near the mouth of the river, which are at present the basis of the business of the place. The owner of these mills has ex-

pended about \$40,000 in improving the river and its mouth by dredging and constructing a pier in the bay to protect the channel. Vessels drawing 5 feet can now enter the river. The object of making an improvement of the mouth of this river is simply to enable vessels navigating the lake to enter the river. For this purpose it is necessary to deepen the channel by dredging, and construct piers to prevent the channel from filling up.

There is a reef about one and a half miles north of the river-mouth which breaks the force of storms, so that a cheaper method of constructing piers can be resorted to here than in Lake Michigan or other localities in the bay.

It is believed that a slab-pier is all that is necessary. The slabs are placed in the pier in layers of various thickness, the layers crossing each other at right angles. For greater security a row of piles is driven on each side of the pier, the piles being 4 feet apart from center to center. The width of the pier is made about 20 feet in less than 9 feet of water, and 30 feet in over that depth.

As the exposure is mainly from the north, it will not be necessary to protect the channel on the south side, except near the shore, and it may be found that the north pier may only need extending out to a depth of 9 or 10 feet.

There is very little demand for this improvement so far as concerns the security of vessels, but it will serve to develop the business of the place and of that section of the country.

With what has already been done, and the favorable locality, the cost of the improvement will be comparatively small.

The estimated cost of a 9-foot channel is \$133,852.40. The cost of a 12-foot channel is \$201,852.31.

I am, general, very respectfully, your obedient servant,

D. C. HOUSTON,

Major of Engineers, United States Army.

Brigadier-General A. A. HUMPHREYS,

Chief of Engineers, United States Army, Washington, D. C.

UNITED STATES ENGINEER OFFICE,
Chicago, Illinois, December 4, 1872.

MAJOR: I have the honor to submit herewith my report on the survey of the mouth of the Pensaukie River, Wisconsin.

In accordance with written instructions, received and dated July 1, 1872, I proceeded to Pensaukie, Wisconsin, but, owing to unforeseen circumstances, was deterred from reaching there until the 12th of July, when I immediately commenced operations.

The Pensaukie River has its mouth on the west coast of Green Bay, at a point twenty-five miles north of Green Bay City. Its length is about thirty-six miles, and takes its rise in a small lake in Shawanaw County. About fourteen miles from its mouth it diverges into two streams, termed the North and South branches.

The town of Pensaukie is located near the mouth of the river, in Oconto County, and has a population of 1,250. It contains three saw-mills, one flouring and grist mill, one shingle-mill, one planing-mill, three hotels, one of which is a three-story and basement brick building, having accommodations for about two hundred guests, and is the finest house north of Milwaukee. There is also one church and school-house, one post-office, one telegraph-office, and one store doing an average yearly business of \$100,000.

Six miles from the mouth there is located a large shingle factory, capacity of which is 12,000,000.

The business is mostly lumber, which is shipped in large quantities to Chicago and Milwaukee. On account of the shallow water in the river, vessels come to anchor in Green Bay, abreast of the river, and lumber-rafts are towed to them.

The Chicago and Northwestern Railroad runs directly through the town, and a large amount of lumber and produce is shipped north and south.

There is in progress of construction a branch railroad, which will run from Stiles,

to connect with the Chicago and Northwestern Railroad at Pensaukie, a distance of seven miles; and also a road in contemplation from Little River, about six miles, making it at once a railroad center.

Present improvement.—This consists of a pile-pier, filled with slabs, which was built about three years ago. It extends into the bay to a depth of 5 feet, and is 1,000 feet in length. In connection with this, there have been constructed over 1,500 feet of slab-pier over the low marsh, which extends along the shore, all of which is built in the very best manner, making a substantial structure. In addition to this, there has also been a large amount of dredging done in the river for about half a mile from the end of the pier, making the channel an average depth of 9 feet. The inner portion of this pier was built three years ago, and the outer portion was finished one year after, during which time it has proved its durability, still remaining in a well-preserved condition. All of this improvement has been carried on under the supervision and with the means of private individuals, at an outlay of \$40,000.

No better farming land can be found anywhere in the State than in this portion of the country. The country bordering on the river is undulating and has a fertile soil. Along its banks and adjacent thereto we find heavy timber-land of maple, beech, oak, and a large amount of pine. Very little waste land or land unadapted to profitable cultivation is to be found; and what there is, is mostly confined to the immediate vicinity of the lake-shore. About four miles from the mouth is to be found a tract of land, bordering on the river, and extending back for over ten miles, that five years ago was covered with a dense growth of timber, most of which has cleared, and is now under cultivation, producing wheat and other cereals unsurpassed in any other section of the country.

Above the town the river is not navigable, being used entirely for logging purposes, there being four dams, the first half a mile from the town, all of which are used to facilitate logging.

Pensaukie is included in the collection district of Milwaukee, which is the nearest port of entry. The nearest light-house south is Green Bay, twenty-five miles distant.

The benefits to be derived from making a harbor of this place would be to add materially to the manufacturing and agricultural interests already developed in that section of the country, besides affording a shelter to a large number of vessels which frequent that locality. All the shipping at this point is now exposed to the inconvenience of wind and sea during all seasons of the year. There is no harbor on the west coast of the bay between Green Bay City and Peshigo, a distance of forty miles. There is, then, forty miles of coast which affords no shelter during heavy storms to the large fleet which frequents this locality.

The natural facilities which this harbor affords, is the protection which it receives on the northeast from the "Oconto Bar," making a natural harbor.

Though the entrance to the river shoals out a long distance, and would require a large amount of dredging to make it accessible, there would require very little, if any, expense to keep an open harbor, on account of the solidity of the sand, which seldom, if ever, moves.

A thorough examination of the lake-bottom was made out to a depth of 15 feet, at that depth from the shore out, the sand was found very solid, with an occasional deposit of gravel.

Soundings were taken in the bay out to a depth of 15 feet. In the river, soundings were taken on cross-lines 50 feet apart, and every 20 feet. The character of the bottom of the river is principally sand, with a deposit of black mud, chiefly composed of decayed vegetable matter.

Owing to the close proximity to the mouth of the first dam, there is no current in the river, except during the spring freshets or a very heavy rain.

The steamers Union and Oconto make daily trips from Green Bay City and touch at Pensaukie.

Appended to this report is a statement of the shipments and receipts for the year ending December 31, 1871.

Amount of exports at Pensaukie, Wisconsin.

Lumber, 16,250,000 feet	\$195,000 00
Shingles, 42,000,000	115,500 00
Laths, 5,218,000	10,436 00
Flour, 1,000 barrels	6,000 00
Bark, 1,250 cords	5,000 00
Cedar posts, 28,000	1,680 00
Fish, 18,000 barrels	171,000 00
	504,616 00

Imports at Pensaukie, Wisconsin.

General merchandise	\$100,000 00
Lime, 3,000 barrels	3,000 00
	103,000 00

The number of arrivals and departures of vessels was 250.
 Previous to this date the railroad was not completed to Pensaukie.
 Estimates for this improvement are herewith respectfully submitted.

For a 12-foot channel extending north pier out to a depth of 12 feet, and south pier to a depth of 9 feet:

28,086 cords slabs, at \$3	\$84,258 00
5,200 piles, at \$5	26,000 00
244,147 cubic yards of dredging, at 30 cents	73,244 10
	183,502 10
Add 10 per cent. for contingencies	18,350 21
Total	201,852 31

For a 9-foot channel, extending north and south piers to a depth of 10 feet:

13,937 cords slabs, at \$3	\$41,811 00
3,500 piles, at \$5	17,500 00
207,910 cubic yards of dredging, at 30 cents	62,373 00
	121,684 00
Add 10 per cent. for contingencies	12,168 40
Total	133,852 40

I am, major, very respectfully, your obedient servant,

WILLIAM J. BRYSON,
Assistant Engineer.

Major D. C. HOUSTON,
Corps of Engineers, United States Army, Chicago, Illinois.

IX.—REMOVAL OF WRECKS FROM THE YAZOO RIVER, MISSISSIPPI.

ENGINEER OFFICE, UNITED STATES ARMY,
Saint Louis, Missouri, January 27, 1873.

GENERAL: I have the honor to forward herewith a copy of report of Mr. I. D. McKown, civil engineer and assistant, upon an examination of the Yazoo River, in Mississippi, made with a view to ascertain the cost of removing from that river the wrecks of vessels sunk there during the war, as required by act of Congress approved June 10, 1872.

Mr. McKown reports the existence of nineteen wrecks which are obstructions to navigation, and recommends the removal of eight of them as being the worst obstructions. He places the cost of such removal at \$5,000 per wreck, or \$40,000 for the eight.

In view of the importance of the commerce of this stream, I concur with Mr. McKown in his recommendations.

Very respectfully, your obedient servant,

J. H. SIMPSON,

Colonel of Engineers, United States Army.

Brigadier-General A. A. HUMPHREYS,
Chief of Engineers, United States Army.

UNITED STATES ENGINEER OFFICE,
Saint Louis, Missouri, January 22, 1873.

COLONEL: I have the honor to submit the following report of the examination of the wrecks of gun-boats, steamers, and other obstructions placed in the Yazoo River during the war.

The Yazoo River is formed by the junction of the Tallahatchie and Yalabusha Rivers, about two hundred and sixty miles above its confluence with the Mississippi. It flows through a fine cotton-raising district, and it is estimated that from 120,000 to 150,000 bales of cotton are made annually in the valley of the Yazoo and its tributaries.

There are about forty wrecks in the river, but only nineteen can be considered obstructions at present, and that come under the head of obstructions placed in the river during the war.

The following tabulated statements contain—

First. A list of all the wrecks that were placed in the river during the war and that are at present obstructions to navigation.

Second. A list of the wrecks that are the worst obstructions to navigation, and the removal of which would materially improve the condition of the stream.

I have not included the gun-boat Cairo in either of the statements, as she has about 5 feet of water over her at low water, and can hardly be classed as an obstruction. She lies about fifteen miles from the mouth of the river, and has all her guns and machinery on board.

Statement of wrecks sunk in Yazoo River during the war that are at present obstructions to navigation.

No.	Name.	Position.	Description.
1	Paul Pry	62 miles above the mouth.....	Packet.
2	Lady Byron.....	65 miles above the mouth.....	Do.
3	Capitol	Liverpool Landing	Do.
4	Van Dorn.....	do	Gun-boat.
5	Ivy	Near Liverpool	Packet.
6	Unicorn	5 miles above Liverpool	Do.
7	Hope	20 miles below Yazoo City.....	Do.
8	Mobile	15 miles below Yazoo City.....	Do.
9	De Kalb	Near Yazoo City	Gun-boat.
10	Magenta	5 miles above Yazoo City.....	Packet.
11	Magnolia	do	Do.
12	Peytona	Near Haines's Landing.....	Do.
13	Natchez	1 mile below Bertonia	Do.
14	John Walt.....	Side by side near Southwart's Landing	Packets.
15	R. J. Lackland		
16	Golden Age.....		
17	Scotland	2 miles below Greenwood.....	Packet.
18	Mary E. Keene.....		
19	Arcadia	1 mile above Greenwood.....	Do.

Statement of wrecks sunk during the war that are the worst obstructions to navigation.

No.	Name.	Position.	Description.
1	Van Dorn.....	Liverpool Landing	Gun-boat.
2	Ivy	Near Liverpool.....	Packet.
3	Magenta.....	5 miles above Yazoo City.....	Do.
4	Magnolia	do	Do.
5	Natchez	1 mile below Bertonia	Do.
6	R. J. Lackland.....	Near Southwart's Landing	Do.
7	Golden Age.....	do	Do.
8	Arcadia	1 mile above Greenwood.....	Do.

Taking into consideration the fact that most of the wrecks are in shallow water, and are well exposed at a low stage, I should estimate the cost of removal at \$5,000 per wreck, making the total cost of removal as follows: Nineteen wrecks, at \$5,000 each, \$95,000.

In consideration of the amount of steamboat traffic on the Yazoo River, I would

respectfully recommend the removal of at least the eight wrecks mentioned as the worst obstructions, the estimated cost of which would be \$40,000.

In the above estimates no consideration has been taken of the value of recovered material.

Very respectfully, your obedient servant,

I. D. McKOWN,
Civil Engineer Assistant.

Colonel J. H. SIMPSON,
Corps of Engineers, United States Army.

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COLUMBIA HOSPITAL FOR WOMEN.

LETTER

FROM THE

ACTING SECRETARY OF THE INTERIOR,

RELATIVE TO

*An appropriation for the completion of the Columbia Hospital for Women,
in the District of Columbia.*

JANUARY 30, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., January 27, 1873.

SIR: I have the honor to transmit herewith a copy of a letter of this date from Dr. J. H. Thompson, surgeon-in-chief of the Columbia Hospital for Women, in the District of Columbia, submitting an estimate of appropriations, amounting to the sum of \$15,000, prepared by the Architect of the Capitol, which will be required in the completion of the alterations now being made in said hospital.

The subject is respectfully submitted for favorable consideration by Congress.

Very respectfully, your obedient servant,

B. R. COWEN,
Acting Secretary.

Hon. JAMES G. BLAINE,
Speaker of the House of Representatives.

COLUMBIA HOSPITAL,
Washington, D. C., January 27, 1873.

SIR: I have the honor to inclose herewith the estimate of Edward Clark, the Architect of the Capitol extension, for the completion of the alterations now being carried on at Columbia Hospital.

I would most respectfully ask for your approval and recommendation to Congress for the passage of the necessary appropriation.

I have the honor to be, very respectfully, your obedient servant,

J. H. THOMPSON,
Surgeon-in-Chief.

Hon. COLUMBUS DELANO,
Secretary of the Interior.

ARCHITECT'S OFFICE, UNITED STATES CAPITOL,
Washington, D. C. January 21, 1873.

GENERAL: Having estimated the cost of the work necessary to complete the building known as the Columbia Hospital for Women, I find that to finish the work now in progress, to put in a steam-heating apparatus, to remodel the upper stories in order to have more rooms, and to ventilate the building properly, the further sum of \$15,000 will be required.

I am, very respectfully, your obedient servant,

EDWARD CLARK, *Architect.*

Surgeon-General J. K. BARNES,

Chairman Building Committee, Columbia Hospital.

EXAMINATION OF CANDIDATES FOR CLERKSHIPS IN THE
WAR DEPARTMENT.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The questions propounded by the examiners to the candidates for appointments and promotions to clerkships in his Department.

JANUARY 30, 1873.—Referred to the Select Committee on the Re-organization of the Civil Service of the United States and ordered to be printed.

WAR DEPARTMENT, *January 28, 1873.*

The Secretary of War has the honor to transmit herewith to the House of Representatives, in accordance with the resolution of the 27th instant, directing that a copy of all the questions propounded by the examiners to the candidates for appointments and promotions to clerkships be furnished; a list of the questions used in the last examination of January 24, 1873, for appointment to fill vacancies in the War Department.

The questions used at each examination vary, but the copy furnished is of a like character to those used in all the examinations previously had.

In cases of promotion they are also similar, with the exception that questions relating to office duties are added thereto.

To give all the questions that have been used would be a work of great labor, and require considerable time to copy.

WM. W. BELKNAP,
Secretary of War.

Questions used for examination of applicants for first-class clerkships in War Department, January 24, 1873.

1. Write a letter addressed to the board of examiners stating previous occupation.

2. Correct grammatical errors in the following sentences :

Make no more mistakes than you can help.

He is a scholar and a gentleman.

Benedict Arnold, who is now another name for traitor, was despised by Englishmen and Americans.

Let you and I be henceforth friends.

His character as well as opinions were assailed.

3. Correct the orthography of the following words :

Disbursement, employeys, traveler, pierce, immagineable, mohogany, miselaneous, consumation, inflammation, incomprihensable, porticoes, sucesion, wagon, misspell, license, irrepareable, heighth, disenfranchise, extraordinary, comemorate.

4. Give the abbreviations of the following :

Anno Domini, honorable, colonel, shilling, degrees, seconds, et cetera, plus, equivalent to, package, bushel, department, merchandise, interest.

5. Copy the following, using proper capitals and punctuation :

office of chief quartermaster fort leavenworth kansas november 29 1872 by direction of the chief quartermaster military division of the missouri the advertisement of this office dated november 7 1872 inviting proposals for transportation of military indian and government supplies to fort sill indian territory and forts richardson and griffin texas for the year ending december 31 1873 is hereby withdrawn the service will soon be advertised for by lieutenant colonel s b hollabird chief quartermaster department of texas at san antonio texas stewart van vleit assistant quartermaster general u s a chief quartermaster department of the missouri.

6. Multiply 895.26 by 42.003.

7. Divide 37.68 by 94.0092.

8. Divide $\frac{4}{7}$ of $\frac{5}{8}$ by $\frac{4}{7}$ of $\frac{14}{16}$ and give the result in vulgar and decimal fractions.

9. Write, in figures, two millions and eighty-three ten thousandths. Express fractions in decimals.

10. What is the interest on \$947.62 for 65 days at $7\frac{3}{10}$ per cent. per annum?

11. What is the value of \$1 of currency when gold is $13\frac{1}{2}$ per cent. premium?

12. The population of the United States in 1840 was 17,069,453, and in 1850 was 23,191,876. What was the percentage of increase?

13. Make out an account, in the name of Richard Robinson, against the United States, for the following: 43,292 pounds of hay, at \$14.50 per ton; 8,506 pounds oats, at $62\frac{1}{2}$ cents per bushel, (32 pounds;) 247 cords 5 feet wood, at \$7.25 per cord; 524 tons coal, at \$9.20 per ton; 70,586 feet lumber, at \$15.37 per thousand; 475 quires paper, at \$3.25 per ream; transporting 84,985 pounds freight to Fort Bridger, Utah Territory, from Omaha, Nebraska, 915 miles, at \$1.12 per 100 pounds per 100 miles.

14. Add the following column of figures:

924, 847, 273, 798. 56
837, 328, 965, 734. 43
46, 249, 874, 629. 75
3, 086, 473, 746. 29
209, 543, 479, 954. 07
746, 847, 768, 643. 23
322, 539, 289, 945. 78
99, 094, 877, 659. 85
745, 583, 970, 584. 07
923, 895, 489, 087. 95
78, 673, 708, 956. 84
497, 958, 693, 413. 32
874, 725, 314, 859. 69
906, 437, 793, 876. 43
692, 314, 916, 735. 76
837, 805, 146, 453. 35
576, 483, 387, 496. 94
398, 876, 849, 150. 42
51, 593, 507, 834. 05
795, 174, 673, 925. 13
84, 639, 978, 649. 09

15. Under what governments were the early expeditions made to America?

16. Name the three earliest settlements made in America.

17. Name some of the engagements occurring between the Colonists and British forces prior to the declaration of independence.

18. What officer was in command of the United States forces in Mexico at the termination of the Mexican war?

19. Who was Secretary of War during the war with Mexico?

20. Name the States bordering on the Gulf of Mexico.

21. Name the State having the largest area, and the one having the smallest area.

22. Name the principal rivers emptying into the Mississippi.

23. Give the capitals of the following States: Connecticut, New Jersey, Illinois, Georgia, Michigan, and Missouri.

24. Where is Kansas City?

25. Under what circumstances can the writ of *habeas corpus* be suspended?

26. Name the divisions of the judiciary of the United States.

27. If a vacancy occurs in the United States Senate during the recess of the legislature of the State in which the vacant Senatorship occurs, how is the vacancy filled?

28. What are the conditions under which the two Houses of Congress may adjourn?

29. In what respect does the legislature of the District of Columbia differ in its formation from the legislatures of the Territories?

REPORT OF IMMIGRANTS.

L E T T E R

FROM

THE SECRETARY OF THE TREASURY,

RELATIVE TO

An act to transfer the duty of making an annual report of immigrants in the United States from the Department of State to the Treasury Department.

JANUARY 30, 1873.—Referred to the Committee on Foreign Affairs and ordered to be printed.

TREASURY DEPARTMENT,
January 28, 1873.

SIR: I have the honor to inclose herewith a copy of a letter addressed to me by the chief of the Bureau of Statistics, under date of the 24th instant, calling my attention to a draught of an act to transfer the duty of making an annual report of immigrants in the United States from the Department of State to the Treasury Department.

In connection with this letter I respectfully refer to my previous letter, addressed to you on the 28th of March last, inclosing sundry papers on the same subject.

I again submit the matter to Congress with the recommendation that it receive favorable consideration.

Very respectfully, your obedient servant,

GEO. S. BOUTWELL,
Secretary.

HON. JAMES G. BLAINE,
Speaker of the House of Representatives.

TREASURY DEPARTMENT,
BUREAU OF STATISTICS,
January 24, 1873.

SIR: The draught of an act to transfer the duty of making an annual report of the arrival of immigrants in the United States from the State Department to the Bureau of Statistics, was submitted at the last session of Congress with your approval as well as that of the Secretary of State, but, I am informed, has not yet been reported upon by the

Committee on Commerce of the Senate. It is particularly desirable that the transfer should be made, in lieu of the fact that in the custom-house in New York two or three clerks are employed in transcribing copies of the manifests for the Department of State who should be relieved from that work, as their services are absolutely necessary in the preparation of statistics for this Bureau. Returns of the arrival of passengers from foreign countries are already made to this Bureau, and classified statements, made therefrom, published not only annually but quarterly. The clerical labor of copying the lists of passengers of all the various vessels which bring immigrants to our shores is altogether unnecessary.

The returns of immigration made to this Bureau are brought more directly under the rigid system of scrutiny exercised by it over all returns received from officers of customs, and the errors and omissions in such statements easily ascertained, and prompt corrections obtained.

I respectfully suggest that you bring to the notice of the Committee on Commerce the urgent necessity there is for the legislation referred to.

Very respectfully yours,

EDWARD YOUNG,
Chief of Bureau.

Hon. GEORGE S. BOUTWELL,
Secretary of the Treasury.

○

UNEXPENDED BALANCES OF APPROPRIATIONS.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

A statement showing the balances of appropriations unexpended on June 30, 1872, the amount appropriated for the service of the fiscal year ending June 30, 1873, &c.

JANUARY 30, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
Washington, D. C., January 16, 1873.

SIR: In compliance with the provisions of the eighth section of the act approved May 1, 1820, (3 Stat., 568,) I have the honor to transmit herewith statements showing the balances of appropriations unexpended on the 30th of June, 1872; the amounts appropriated for the service of the fiscal year ending June 30, 1873; the net expenditures for the quarter ended September 30, 1872, and the estimated amounts that may be required to complete the service of the year, or of prior years, or that may be carried to the surplus fund.

The balances of appropriations contained in the statement marked A are not limited by law to fiscal years; those included in statements B and C are limited to the fiscal years for which the appropriations were made; and the appropriations contained in statement D, made for the present fiscal year, are subject to the provisions of the fifth section of the act of July 12, 1870, (16 Stat., 251,) and can be expended only for the service of the current fiscal year.

I am, very respectfully,

GEO. S. BOUTWELL,
Secretary.

Hon. JAMES G. BLAINE,
Speaker of the House of Representatives.

UNEXPENDED BALANCES OF APPROPRIATIONS.

A.—Statement of balances of appropriations July 1, 1872, made for fiscal year ended June 30, 1872, and appropriations made for the service of the fiscal year 1873—not limited by law to fiscal years—together with a statement of the amounts expended during the first quarter of the year and the amounts available for the service of the three remaining quarters of the year.

Appropriations.	Balances at commencement of current fiscal year, July 1, 1872.	Appropriated for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures during first quarter of current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
TREASURY.							
Post-office and court-house at—							
Utica, New York.....	\$586,090 25	\$200,000 00	\$200,000 00		\$81,693 50	\$200,000 00	
Boston, Massachusetts.....	100,000 00	50,000 00	636,090 25		190 05	554,396 75	
Trenton, New Jersey.....		150,000 00	250,000 00			249,809 95	
Little Rock, Arkansas.....		100,000 00	100,000 00			100,000 00	
Indianapolis, Indiana.....		200,000 00	200,000 00		8,511 50	191,488 50	
Raleigh, North Carolina.....		100,000 00	100,000 00		79 60	99,920 40	
Outstanding liabilities.....	61,937 45		61,937 45	\$16,161 66		78,099 11	
Purchase of Moran's painting of the Cañon of the Yellowstone.....		10,000 00	10,000 00		10,000 00		
Relief of—							
William H. Safford.....		500 00	500 00		500 00		
Charles Heipp.....		223 00	223 00		223 00		
William Nixon.....		579 63	579 63		579 63		
Edward G. Allen.....		1,480 00	1,480 00		1,480 00		
Repayment of fine to C. M. Lockwood.....		477 56	477 56			477 56	
Expenses of national loan.....					508,466 90		
Refunding national debt.....					25,389 00		
Salaries and expenses of Southern Claims Commission.....					14,200 00		
Refunding taxes illegally collected.....					35 13		
Return of proceeds of captured and abandoned property.....					1,357,830 40		
Repayment for land sold for direct taxes.....					8,050 00		
Expenses of the Smithsonian Institution.....					19,500 00		
Payment for coin-nickel national-bank notes destroyed by fire at Chicago.....					370,845 07		
Contingent expenses of steam-vessels.....					12,162 86		
Relief of R. R. Bolling.....					23,838 77		
Relief of F. and E. Reed.....		1,200 00	1,200 00		1,200 00		
Consular receipts.....					2,253 69		
Payment to Mary B. Walker, for expenses of Robert J. Walker, late territorial governor of Kansas.....	2,010 75		2,010 75			2,010 75	
Payment to Stephen G. Montana.....	41,782 38		41,782 38			41,782 38	

Payment to Juan del Carmon Vergel	1, 170 00	.....	.....	1, 170 00	.....
Relief of the officers and crew of the ship Nightingale	216 46	.....	.....	216 46	.....
Payment to owners of the Norwegian bark General Berch	3, 239 00	.....	.....	3, 239 00	.....
Relief of F. E. Spinner, to replace deficit by C. C. Edwins	9 01	.....	.....	9 01	.....
Relief of the heirs of John Chilton	168 00	.....	.....	168 00	.....
Building or purchase of such other vessels as may be required by the revenue service	26, 357 52	.....	24, 853 80	51, 211 32	.....
Collecting the revenue from customs	572, 834 71	5, 500, 000 00	.....	1, 787, 952 84	4, 284, 881 87
Repayment to importers of excess of deposits for unascertained duties .....	.....	.....	.....	*579, 510 13	.....
Payment of debentures or drawbacks, bounties or allowances .....	.....	.....	.....	*378, 489 46	.....
Distributive shares of fines, penalties, or forfeitures .....	.....	.....	.....	*22, 648 67	.....
Refunding duties .....	.....	.....	.....	*4, 248 17	.....
Drawback on certain articles imported into Chicago .....	.....	.....	.....	*932 50	.....
Debentures and other charges .....	.....	.....	.....	*4, 456 03	.....
Compensation of persons employed in insurrectionary States .....	.....	.....	.....	*250 00	.....
Refunding duties on tea and coffee .....	.....	.....	.....	*124, 750 93	.....
Allowance or drawback .....	.....	.....	.....	*84, 450 26	.....
Refunded taxes illegally collected .....	.....	.....	.....	*182, 730 27	.....
Refunding money erroneously covered into the Treasury; act of July 23, 1866, section twelve .....	.....	.....	.....	*250 00	.....
Redemption of stamps; act of June 30, 1864 .....	.....	.....	.....	*72 08	.....
Relief of A. G. Booth; act of June 10, 1872 .....	.....	.....	.....	*3, 340 98	.....
CUSTOMS.					
Newport Harbor light-station, Rhode Island .....	.....	800 00	.....	800 00	.....
Beaver Tail light-station, Rhode Island .....	.....	5, 000 00	.....	5, 000 00	.....
Point Judith light-station, Rhode Island .....	.....	5, 000 00	.....	5, 000 00	.....
Block Island light-station, Rhode Island .....	.....	1, 800 00	.....	1, 800 00	.....
Bullocks' Point light-station, Rhode Island .....	.....	1, 000 00	.....	1, 000 00	.....
Whale Spindle, Mystic River, light-station, Connecticut .....	.....	5, 000 00	.....	5, 000 00	.....
Race Rock light-station, New York	99, 907 00	40, 000 00	.....	139, 907 00	120, 012 60
Montauk Point light-station, New York .....	.....	9, 500 00	.....	9, 500 00	.....
Long Beach Bar light-station, New York .....	.....	20, 000 00	.....	20, 000 00	.....
Oyster Bond Point light-station, New York .....	.....	5, 000 00	.....	5, 000 00	.....
Block Island light-station, New York .....	.....	75, 000 00	.....	75, 000 00	.....
Hart Island light-station, New York .....	.....	50, 000 00	.....	50, 000 00	.....
Fort Tompkins' light-station, New York .....	.....	8, 000 00	.....	8, 000 00	.....
Crown Point light-station, New York .....	.....	1, 500 00	.....	1, 500 00	.....
Hudson City light-station, New York .....	.....	35, 000 00	.....	35, 000 00	.....
Light-house supplies depot, Staten Island, New York .....	.....	10, 000 00	.....	10, 000 00	.....
Sand Point, Gt. West Bay, and Fire Island light-station, New York .....	.....	4, 600 00	.....	4, 600 00	.....
Fort Hamilton and Fort Columbus fog-bells, New York .....	.....	1, 500 00	.....	1, 500 00	.....
Presque Isle light-station, Pennsylvania .....	.....	15, 000 00	.....	15, 000 00	.....
Hereford Inlet light-station, New Jersey .....	.....	25, 000 00	.....	25, 000 00	.....
Mispillion River light-station, Delaware .....	.....	5, 000 00	.....	5, 000 00	.....
Craighill Channel light-station, Maryland .....	.....	45, 000 00	.....	45, 000 00	.....
Shipping Point light-station, Virginia .....	.....	9, 000 00	.....	9, 000 00	.....
Bodies' Island light-station, North Carolina .....	.....	15, 000 00	.....	15, 000 00	.....
Cape Lookout light-station, North Carolina .....	.....	5, 000 00	.....	5, 000 00	.....
Hunting Island light-station, South Carolina .....	.....	25, 000 00	.....	25, 000 00	.....

A.—Statement of balances of appropriations July 1, 1872, made for fiscal year ended June 30, 1872, &c.—Continued.

Appropriations	Balances at commencement of current fiscal year July 1, 1872.	Appropriated for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures during first quarter of current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
CUSTOMS—Continued.							
Southwest Pass light-station, Louisiana		\$25,000 00	\$25,000 00		\$1,000 00	\$24,000 00	
Saint Augustine light-station, Florida		20,000 00	20,000 00		20,000 00		
Bolivar Point light-station, Texas		10,000 00	10,000 00		8,388 15	1,611 85	
Gibraltar light-station, Michigan		10,000 00	10,000 00		5,015 60	4,984 40	
Spectacle Reef light-station, Michigan		70,000 00	70,000 00		40,011 80	29,988 20	
Saint Helena light-station, Michigan		14,000 00	14,000 00		5,000 00	9,000 00	
Petite Point au Sable light-station, Michigan		35,000 00	35,000 00		5,000 00	30,000 00	
Holland light-station, Michigan		4,000 00	4,000 00			4,000 00	
Detroit depot, Michigan		25,000 00	25,000 00		5,000 00	20,000 00	
Pier-head beacon-lights on the lakes		20,000 00	20,000 00		7,600 00	12,400 00	
Light-station between White Fish Point and Grand Island Harbor, Lake Superior		40,000 00	40,000 00		5,000 00	35,000 00	
Point Reyes light-station, California		10,000 00	10,000 00		4,450 00	5,550 00	
Point Fermi light-station, California		20,000 00	20,000 00			20,000 00	
Point Hueneme light-station, California		10,000 00	10,000 00			10,000 00	
Carquinas Straits light-station, California		20,000 00	20,000 00			20,000 00	
Piedras Blancas light-station, California		75,000 00	75,000 00			75,000 00	
Sea Flower Reef beacon, New York		4,200 00	4,200 00		4,200 00		
Custom-house at—							
Saint Louis, Missouri	300,000 00	500,000 00	800,000 00		350,113 35	449,886 65	
Hartford, Connecticut		400,000 00	400,000 00		112 00	399,888 00	
Albany, New York		450,000 00	450,000 00			450,000 00	
Rockland, Maine		25,000 00	25,000 00			25,000 00	
Steam fog-signal on Seguin Island, Maine		5,000 00	5,000 00		5,000 00		
Burnt Coat Harbor light-station, Maine		10,000 00	10,000 00			10,000 00	
Colchester Reef light-station, Vermont		4,500 00	4,500 00		4,500 00		
Wood End light-station, Massachusetts		15,000 00	15,000 00		10,000 00	5,000 00	
Newburyport light-station, Massachusetts		10,000 00	10,000 00		5,000 00	5,000 00	
Total	1,795,722 53	8,568,860 19	10,364,582 72	\$41,015 46	6,221,596 72	7,912,702 76	

WAR DEPARTMENT.

					For current fiscal year.				
Fort on Willett's Point, New York.....	12,308 50	76,500 00	88,808 50	12,000 00	76,808 50				
Battery Hudson, New York.....	8,500 00	17,000 00	25,500 00	3,000 00	22,500 00				
Fort Wood, New York.....		17,000 00	17,000 00		17,000 00				
Battery Midlin, Pennsylvania.....	26,431 53	72,000 00	98,431 53		98,431 53				
New Fort, opposite Fort Delaware, Delaware.....	4,000 00	42,500 00	46,500 00	9,000 00	37,500 00				
Battery at Finn's Point, Pennsylvania.....	44,500 00		44,500 00	15,000 00	29,500 00				
Fort McHenry, Maryland.....		21,000 00	21,000 00		21,000 00				
Fort at Lazaretto Point, Maryland.....		13,000 00	13,000 00		13,000 00				
Fort Foote, Maryland.....		21,000 00	21,000 00		21,000 00				
Fort Washington, Maryland.....		21,000 00	21,000 00		21,000 00				
Fort Monroe, Virginia.....		42,500 00	42,500 00	4,500 00	38,000 00				
Fort Sumter, South Carolina.....	30,748 06	35,000 00	65,748 06		65,748 06				
Fort Moultrie, South Carolina.....	387 04	35,000 00	35,387 04	15,000 00	20,387 04				
Fort Jackson, Georgia.....		15,000 00	15,000 00		15,000 00				
Fort Pulaski, Georgia.....	3,500 00	25,000 00	28,500 00	18,500 00	10,000 00				
Fort Taylor, Florida.....		42,500 00	42,500 00	1,000 00	41,500 00				
Fort Jefferson, Florida.....		42,500 00	42,500 00		42,500 00				
Fort Jackson, Louisiana.....	1,129 64	64,000 00	65,129 64	25,000 00	40,129 64				
Fort Saint Philip, Louisiana.....	7,392 18	42,500 00	49,892 18	17,000 00	32,892 18				
Fort at Alcatraz Island, California.....	36,000 00	42,500 00	78,500 00	15,000 00	63,500 00				
Fort Point, California.....	400 00	85,000 00	85,400 00	14,393 91	71,006 09				
Fort Lime Point, California.....	12,300 00	75,000 00	87,300 00	15,000 00	72,300 00				
Purchase of sites for sea-coast defenses.....	142,233 96		142,233 96	628 28	141,605 68				
Construction of sea-coast mortar-batteries.....	39,640 00	100,000 00	139,640 00	35,000 00	104,640 00				
Permanent platforms for modern cannon of large caliber.....		50,000 00	50,000 00	18,225 40	31,774 60				
Contingencies of fortifications.....	64,567 02	250,000 00	314,567 02	19,099 37	295,467 65				
Surveys for military defenses.....	114,325 86	150,000 00	264,325 86	24,405 00	239,920 86				
Repairs of harbors on the Atlantic coast.....	773 18		773 18		773 18				
Repairs of harbors on the Northern lakes.....	11,655 97		11,655 97		11,655 97				
Improving harbor at—									
Portland, Maine.....		45,000 00	45,000 00	5,000 00	40,000 00				
Wells, Maine.....		5,000 00	5,000 00	2,000 00	3,000 00				
Burlington, Vermont.....	5,145 99	30,000 00	35,145 99		35,145 99				
Boston, Massachusetts.....		75,000 00	75,000 00	15,000 00	60,000 00				
Gloucester, Massachusetts.....		10,000 00	10,000 00	4,000 00	6,000 00				
Plymouth, Massachusetts.....		2,500 00	2,500 00	2,500 00					
Provincetown, Massachusetts.....		5,000 00	5,000 00	5,000 00					
Edgartown, Massachusetts.....		20,000 00	20,000 00	1,000 00	19,000 00				
Wellfleet, Massachusetts.....		5,000 00	5,000 00	5,000 00					
Duxbury, Massachusetts.....		10,000 00	10,000 00	3,000 00	7,000 00				
Wareham, Massachusetts.....		10,000 00	10,000 00	1,000 00	9,000 00				
New Haven, Connecticut.....	5,000 00	35,000 00	40,000 00	15,000 00	25,000 00				
Bridgeport, Connecticut.....		40,000 00	40,000 00	10,000 00	30,000 00				
Norwalk, Connecticut.....		10,000 00	10,000 00	10,000 00					
Oswego, New York.....	37,656 24	100,000 00	137,656 24	40,000 00	97,656 24				
Ogdensburg, New York.....	7,892 72	10,000 00	17,892 72	7,000 00	10,892 72				
Oak Orchard, New York.....	3,573 73	2,500 00	6,073 73	5,000 00	1,073 73				
Plattsburgh, New York.....	1,073 68	10,000 00	11,073 68		11,073 68				

UNEXPENDED BALANCES OF APPROPRIATIONS.

A.—Statement of balances of appropriations July 1, 1872, made for fiscal year ended June 30, 1872, &c.—Continued.

Appropriations.							
	Balances at commencement of current fiscal year, July 1, 1872.	Appropriations for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures for current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
WAR DEPARTMENT—Continued.							
Improving harbor at—	\$5,700 00		\$5,700 00		\$3,000 00	\$2,700 00	
Charlotte, New York.....		\$25,000 00	25,000 00		17,000 00	8,000 00	
Dunkirk, New York.....		98,485 04	98,485 04		62,425 04	30,000 00	
Buffalo, New York.....		10,000 00	10,000 00		2,000 00	2,000 00	
Pultneyville, New York.....		10,000 00	10,000 00		2,000 00	2,000 00	
Olcott, New York.....		15,000 00	15,000 00		2,500 00	12,500 00	
Little Sodus Bay, New York.....		15,000 00	15,000 00		4,500 00	10,500 00	
Great Sodus Bay, New York.....		12,000 00	12,000 00			12,000 00	
Port Chester, New York.....		10,000 00	10,000 00			10,000 00	
Rondout, New York.....		15,000 00	15,000 00			15,000 00	
Port Jefferson, New York.....		22,500 00	22,500 00		10,000 00	12,500 00	
Huntington, New York.....		15,000 00	15,000 00		1,000 00	14,000 00	
Erie, Pennsylvania.....	10,712 12		10,712 12			10,712 12	
Marcus Hook, Pennsylvania.....		10,000 00	10,000 00		2,000 00	8,000 00	
Wilmington, Delaware.....		27,000 00	27,000 00		4,000 00	23,000 00	
New Castle, Delaware. (Repairs of pier).....		6,000 00	6,000 00			6,000 00	
Queenston, Maryland.....		12,000 00	12,000 00			12,000 00	
Warton, Maryland.....		10,000 00	10,000 00			10,000 00	
Cambridge, Maryland.....		100,000 00	100,000 00			100,000 00	
Baltimore, Maryland.....		15,000 00	15,000 00		1,000 00	14,000 00	
Toledo, Ohio.....		13,000 00	13,000 00		2,000 00	11,000 00	
Sandusky, Ohio.....		15,000 00	15,000 00		1,000 00	14,000 00	
Ashtabula, Ohio.....		5,000 00	5,000 00		1,000 00	4,000 00	
Vermillion, Ohio.....		8,000 00	8,000 00		1,000 00	7,000 00	
Port Clinton, Ohio.....		10,000 00	10,000 00		1,000 00	9,000 00	
Rocky River, Ohio.....		20,000 00	20,000 00			20,000 00	
Black River, Ohio.....	43,664 59		43,664 59			43,664 59	
Grand River, Ohio.....	8,300 00		8,300 00			8,300 00	
Huron, Ohio.....		50,000 00	50,000 00			50,000 00	
Marquette, Michigan.....		5,000 00	5,000 00			5,000 00	
New Buffalo, Michigan.....		10,000 00	10,000 00			10,000 00	
Frankfort, Michigan.....		10,000 00	10,000 00			10,000 00	
Manistee, Michigan.....		10,000 00	10,000 00			10,000 00	
Pere Marquette, Michigan.....		10,000 00	10,000 00			10,000 00	

Pent Water, Michigan.....	30,000 00	.....	.....	.....	30,000 00
White River, Michigan.....	10,000 00	.....	.....	.....	10,000 00
Muskegon, Michigan.....	10,000 00	.....	.....	.....	10,000 00
Grand Haven, Michigan.....	15,000 00	.....	.....	.....	15,000 00
Black Lake, Michigan.....	10,000 00	.....	.....	3,000 00	7,000 00
Saugatuck, Michigan.....	15,000 00	.....	.....	5,000 00	10,000 00
North Haven, Michigan.....	12,000 00	.....	.....	5,000 00	7,000 00
Saint Joseph, Michigan.....	3,000 00	.....	.....	3,000 00	.....
Cheboygan, Michigan.....	15,000 00	.....	.....	10,000 00	5,000 00
Monroe, Michigan.....	10,000 00	.....	.....	1,000 00	9,000 00
Harbor of Refuge, Michigan.....	100,000 00	.....	.....	10,000 00	177,800 00
Eagle Harbor, Michigan.....	87,800 00	.....	.....	.....	14,161 11
Ontonagon, Michigan.....	14,161 11	.....	.....	.....	82 41
Monomonic, Michigan and Wisconsin.....	25,000 00	.....	.....	.....	25,000 00
Michigan City, Indiana.....	50,000 00	.....	.....	10,000 00	50,000 00
Chicago, Illinois.....	90,000 00	.....	.....	.....	90,000 00
Calumet, Illinois.....	40,000 00	.....	.....	.....	40,000 00
Superior City, Wisconsin.....	50,000 00	.....	.....	.....	50,000 00
Abnapee, Wisconsin.....	25,000 00	.....	.....	.....	25,000 00
Two Rivers, Wisconsin.....	25,000 00	.....	.....	.....	25,000 00
Sheboygan, Wisconsin.....	18,000 00	.....	.....	.....	18,000 00
Port Washington, Wisconsin.....	15,000 00	.....	.....	.....	15,000 00
Kenosha, Wisconsin.....	10,000 00	.....	.....	5,000 00	5,000 00
Milwaukee, Wisconsin.....	.....	.....	.....	15,000 00	15,000 00
Manitowoc, Wisconsin.....	.....	.....	.....	11,400 00	11,400 00
Du Luth, Minnesota.....	50,000 00	.....	.....	.....	50,000 00
Savannah, Georgia.....	50,000 00	.....	.....	.....	50,000 00
Cedar Keys, Florida.....	7,500 00	.....	.....	.....	7,500 00
Mobile, Alabama.....	75,000 00	.....	.....	17,809 60	80,712 27
Galveston, Texas.....	31,000 00	.....	.....	6,500 00	24,500 00
San Francisco, California.....	50,000 00	.....	.....	500 00	49,500 00
Improving—	.....	.....	.....	.....	.....
Saint Croix River, Maine.....	15,000 00	.....	.....	.....	15,000 00
Union River, Maine.....	25 00	.....	.....	.....	25 00
Saco River, Maine.....	20	.....	.....	7,000 00	8,000 20
Repairs of piers of Saco River, Maine.....	3 05	.....	.....	.....	3 05
Improving—	.....	.....	.....	.....	.....
Narraguagus River, Maine.....	.....	.....	.....	7,000 00	3,000 00
Sullivan's River and Falls, Maine.....	.....	.....	.....	9,000 00	16,000 00
Penobscot River, Maine.....	.....	.....	.....	.....	40,000 00
Richmond's Island, Maine.....	.....	.....	.....	10,000 00	10,000 00
Kennebec River, Maine.....	.....	.....	.....	6,000 00	2,000 00
Royal's River, Maine.....	.....	.....	.....	5,000 00	5,000 00
Cocheco, New Hampshire.....	.....	.....	.....	.....	10,000 00
Otter Creek, Vermont.....	.....	.....	.....	.....	10,000 00
Taunton River, Massachusetts.....	.....	.....	.....	5,000 00	5,000 00
Merrimac River, Massachusetts.....	.....	.....	.....	5,000 00	20,000 00
Providence River, Rhode Island.....	16 98	.....	.....	3,000 00	7,016 98
Pawtucket River, Rhode Island.....	5 96	.....	.....	10,000 00	5 96
Pawtucket River, Rhode Island and Connecticut.....	.....	.....	.....	1,000 00	9,000 00
Thames River, Connecticut.....	9,630 30	.....	.....	14,600 00	5,000 30
Connecticut River, Connecticut.....	10,000 00	.....	.....	15,000 00	60,000 00

UNEXPENDED BALANCES OF APPROPRIATIONS.

A.—Statement of balances of appropriations July 1, 1872, made for fiscal year ended June 30, 1872, &c.—Continued.

Appropriations.		Balances at commencement of current fiscal year, July 1, 1872.	Appropriations for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures for current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
WAR DEPARTMENT—Continued.								
Improving—								
Housatonic River, Connecticut.....			\$15,000 00	\$15,000 00		\$10,000 00	\$5,000 00	
Hudson River, New York.....			40,000 00	40,000 00			40,000 00	
Removing obstructions in East River and Hellgate, New York.....			225,000 00	225,000 00		65,000 00	160,000 00	
Improving—								
Peconic River, New York.....			10,000 00	10,000 00			10,000 00	
Delaware River, New Jersey.....			10,000 00	10,000 00		2,500 00	7,500 00	
Passaic River, New Jersey.....			25,000 00	25,000 00			25,000 00	
Monongahela River, Pennsylvania.....			25,000 00	25,000 00		1,000 00	24,000 00	
Clearing and buoying the channel of Schuylkill River, Pennsylvania.....			40,000 00	40,000 00		4,000 00	36,000 00	
Improving—								
Ship-canal in Patapsco River and Chesapeake Bay, Maryland.....		\$30,000 00		30,000 00		30,000 00		
Northeast River, Maryland.....			10,000 00	10,000 00		10,000 00		
Wicomico River, Maryland.....			5,000 00	5,000 00		5,000 00		
Rappahannock River, Virginia.....			15,000 00	15,000 00		5,000 00	10,000 00	
Appomattox River, Virginia.....		10,000 00	40,000 00	50,000 00		20,000 00	30,000 00	
James River, Virginia.....		20,000 00	50,000 00	70,000 00		20,000 00	50,000 00	
Aquia Creek, Virginia.....			1,500 00	1,500 00			1,500 00	
Accotink River, Virginia.....			5,000 00	5,000 00		5,000 00		
Roanoke River, North Carolina.....			10,000 00	10,000 00			10,000 00	
Cape Fear River, North Carolina.....			100,000 00	100,000 00		20,000 00	80,000 00	
Ship-channel in Charleston Harbor, South Carolina.....		13,000 00	38,700 00	51,700 00		13,000 00	38,700 00	
Removing obstructions in Town Creek, near Charleston, South Carolina.....		2,845 74		2,845 74			2,845 74	
Removing obstructions in Ashepoo River, South Carolina.....			1,300 00	1,300 00			1,300 00	
Improving—								
The mouth of Saint John's River, Florida.....			10,000 00	10,000 00		5,000 00	5,000 00	
Tombigbee River, Alabama.....			10,000 00	10,000 00		10,000 00		
The mouth of the Mississippi River, Louisiana.....		8,083 00	155,000 00	163,083 00		75,000 00	88,083 00	
Jones Bayou, Louisiana.....			20,000 00	20,000 00			20,000 00	
Calcasieu Pass, Louisiana.....			15,000 00	15,000 00			15,000 00	
Tangipahoa River, Louisiana.....			2,500 00	2,500 00			2,500 00	
Raft in Red River, Louisiana.....			150,000 00	150,000 00		32,000 00	118,000 00	
The Bayou Teche, Louisiana.....		4,463 54		4,463 54	\$573 73		5,037 27	
Quachita River, Louisiana and Arkansas.....			100,000 00	100,000 00			100,000 00	
Removing wreck of gun-boat Oregon, in Chifunete River, Louisiana.....			6,000 00	6,000 00			6,000 00	

UNEXPENDED BALANCES OF APPROPRIATIONS.

Improving—						
Bar in Galveston Bay, Texas		10,000 00	10,000 00	10,000 00	5,000 00	5,000 00
Cyprus Bayou, Texas		10,000 00	10,000 00	10,000 00	3,000 00	7,000 00
Cumberland River, Tennessee		20,000 00	30,000 00	30,000 00	10,000 00	20,000 00
Tennessee River, Tennessee		75,000 00	135,000 00	135,000 00	20,000 00	115,000 00
Osage River, Missouri		25,000 00	35,000 00	35,000 00		35,000 00
Falls of Ohio River and Louisville Canal		300,000 00	330,001 00	330,001 00	20,000 00	250,001 00
Sandusky River, Ohio		10,000 00	10,000 00	10,000 00		10,000 00
Maumee River, Ohio		7,000 00	7,000 00	7,000 00	1,000 00	6,000 00
Ohio River, Ohio		200,000 00	200,000 00	200,000 00	65,000 00	135,000 00
Wabash River, Indiana		50,000 00	50,000 00	50,000 00	10,000 00	40,000 00
Illinois River, Illinois	9,000 00		9,000 00	9,000 00	9,000 00	
Mississippi River		125,000 00	125,000 00	125,000 00	18,000 00	107,000 00
Des Moines Rapids, Mississippi River		400,000 00	400,000 00	400,000 00	56,000 00	344,000 00
Rock Island Rapids, Mississippi River	80,700 28	50,000 00	130,700 28	130,700 28	53,000 00	77,700 28
Snag boats and dredges on the Mississippi River		42,000 00	42,000 00	42,000 00	12,000 00	30,000 00
Preserving the Falls of Saint Anthony and navigation of Mississippi River		50,000 00	50,000 00	50,000 00	4,500 00	45,500 00
Improving—						
The Mississippi, Missouri, and Arkansas Rivers	48,150 46	90,000 00	138,150 46	138,150 46	24,000 00	114,150 46
The Little Missouri River, Arkansas		10,000 00	10,000 00	10,000 00	8,000 00	2,000 00
The Current River, Missouri		5,000 00	5,000 00	5,000 00		5,000 00
The An Sable River, Michigan		10,000 00	10,000 00	10,000 00		10,000 00
Mouth of Black River, Michigan		15,000 00	15,000 00	15,000 00	10,000 00	5,000 00
Saint Clair Flats, Michigan		4,000 00	4,000 00	4,000 00		4,000 00
Saint Mary's River and Falls Canal, Michigan	240,000 00	300,000 00	540,000 00	540,000 00	20,000 00	520,000 00
Mouth of Saginaw River, Michigan	52,000 00		52,000 00	52,000 00	33,500 00	18,500 00
Wisconsin River, Wisconsin		10,000 00	10,000 00	10,000 00		10,000 00
Minnesota River, Minnesota			4,685 89	4,685 89		4,685 89
Unpqua River, Oregon	9,206 64		9,206 64	9,206 64		9,206 64
Removing obstructions in Willamette River, Oregon		50,000 00	50,000 00	50,000 00	10,800 00	39,200 00
Improving Lower Willamette River, Oregon		50,000 00	50,000 00	50,000 00	1,000 00	49,000 00
Improving Upper Columbia River, Oregon						
Examinations and surveys on—						
Atlantic coast	1,559 87		1,559 87	1,559 87	1,500 00	59 87
Pacific coast	23,384 23		23,384 23	23,384 23		23,384 23
Northwestern lakes	66,931 12		66,931 12	66,931 12	21,800 00	45,131 12
Northwestern rivers	19 65		19 65	19 65		19 65
Breakwater at Block Island, Rhode Island	24,996 08	50,000 00	74,996 08	74,996 08	15,000 00	59,996 08
Breakwater at Wilmington, California	54,000 00	75,000 00	129,000 00	129,000 00	35,000 00	94,000 00
Delaware Breakwater at Delaware Bay	953 40		953 40	953 40	100 00	853 40
Constructing pier in Delaware Bay, at Lewes, Delaware	138,500 00		138,500 00	138,500 00		138,500 00
Examinations and surveys of rivers and harbors	2,856 35	150,000 00	152,856 35	152,856 35	51,675 00	101,181 35
Medical Hospital Department. (Transfer-account)	15,850 38		15,850 38	15,850 38	1,115 10	14,735 28
Contingencies of the Army. (Transfer-account)	385,722 09		385,722 09	385,722 09	6,496 10	379,225 99
Transportation, services, and supplies of Oregon and Washington volunteers	238,571 21		238,571 21	238,571 21		238,571 21
Pay of Oregon and Washington volunteers	125,818 97		125,818 97	125,818 97		125,818 97
Capture of Jefferson Davis	5,605 38		5,605 38	5,605 38	586 00	5,019 38
Payment of expenses under the reconstruction acts	143,986 29		143,986 29	143,986 29	290 90	143,695 39
Arming and equipping the militia	1,145,041 05	200,000 00	1,345,041 05	1,345,041 05	2,300 00	1,342,741 05
Fort Gorges, Maine	194 00	20,000 00	20,194 00	20,194 00	10,000 00	10,194 00
Fort Preble, Maine	8,225 51	42,500 00	50,725 51	50,725 51	10,000 00	40,725 51
Fort Scammel, Maine	150 53	42,500 00	42,650 53	42,650 53	10,000 00	32,650 53

A.—Statement of balances of appropriations July 1, 1872, made for fiscal year ended June 30, 1872, &c.—Continued.

Appropriations.							
	Balances at commencement of current fiscal year, July 1, 1872.	Appropriations for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures for current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
WAR DEPARTMENT—Continued.							
Battery on Portland Head, Maine.....	.....	\$50,000 00	\$50,000 00	.....	.....	\$50,000 00	.....
Fort Independence, Massachusetts.....	\$21,500 00	42,500 00	64,000 00	.....	\$10,000 00	54,000 00	.....
Fort Warren, Massachusetts.....	42,000 00	85,000 00	127,000 00	.....	15,000 00	112,000 00	.....
Fort Winthrop, Massachusetts.....	16,455 00	64,000 00	80,455 00	.....	15,000 00	65,455 00	.....
Battery on Long Island Head, Massachusetts.....	17,500 00	.....	17,500 00	.....	.....	17,500 00	.....
Fort Adams, Rhode Island.....	.....	85,000 00	85,000 00	.....	15,000 00	70,000 00	.....
Permanent defenses in Narragansett Bay, Rhode Island.....	57,496 30	.....	57,496 30	.....	20,000 00	37,496 30	.....
Fort Hamilton and additional batteries in New York Harbor, New York.....	17,499 77	40,000 00	57,499 77	.....	10,000 00	47,499 77	.....
Fort on site of Fort Tompkins.....	16,501 12	83,000 00	99,501 12	.....	20,000 00	79,501 12	.....
Fort Schuyler.....	24,600 00	85,000 00	109,600 00	.....	24,600 00	85,000 00	.....
Purchase of property of the Green Bay and Mississippi Canal Company.....	.....	145,000 00	145,000 00	.....	145,000 00	.....	.....
Bronze equestrian statue of Lieutenant-General Winfield Scott.....	2,000 00	.....	2,000 00	.....	\$18,000 00	.....	.....
Relief of—	.....	.....	.....	.....	.....	.....	.....
F. and H. Sayles.....	88,688 15	.....	88,688 15	.....	.....	88,688 15	.....
G. H. Rupp.....	.....	100 00	100 00	.....	.....	100 00	.....
Milo Pratt.....	.....	2,000 00	2,000 00	.....	.....	2,000 00	.....
Mary M. Clark.....	.....	1,202 00	1,202 00	.....	1,202 00	.....	.....
Legal representatives of the late George T. Wiggins.....	.....	100 00	100 00	.....	.....	1,000 00	.....
Thomas B. Stewart and A. M. Conu.....	.....	1,443 36	1,443 36	.....	.....	1,443 36	.....
C. H. Thompson.....	.....	3,100 00	3,100 00	.....	.....	3,100 00	.....
Omaha National Bank.....	.....	1,503 96	1,503 96	.....	.....	1,503 96	.....
J. W. Phelps.....	.....	555 00	555 00	.....	555 00	.....	.....
T. D. West.....	.....	910 00	910 00	.....	910 00	.....	.....
A. Grant.....	.....	47,000 00	47,000 00	.....	40,986 63	6,093 37	.....
T. F. Spencer.....	.....	100 00	100 00	.....	.....	100 00	.....
Payment to member of certain military organizations in Kansas.....	.....	.....	.....	.....	501 35	.....	.....
Bounty under act of July 28, 1866.....	.....	.....	.....	.....	82,989 00	.....	.....
Relief of S. B. Mitchell, G. W. Mitchell, J. W. Mitchell, and W. Webster.....	.....	.....	.....	.....	2,592 87	.....	.....
Traveling expenses of California and Nevada volunteers.....	.....	.....	.....	.....	10,000 00	.....	.....
Relief of Harriet Spring.....	.....	.....	.....	.....	8,510 67	.....	.....
Allowance for reduction of wages under eight-hour law.....	.....	.....	.....	.....	28,075 70	.....	.....
Total.....	4,920,164 78	7,907,399 36	12,127,564 14	\$573 73	2,137,552 92	10,139,254 54	.....

NAVY.

Prize-money to captors	728,759 40		728,759 40		57,012 97	671,746 43
Bounty for the destruction of enemy's vessels	135,786 77		135,786 77		1,386 20	134,400 57
Extra pay to officers serving in the Pacific	41 93		41 93			41 93
Medals of honor	4,986 00		4,986 00			4,986 00
Navy pension fund	500,793 64		500,793 64		15,720 01	485,073 63
Naval cemetery near Philadelphia	619 25		619 25			619 25
Coal depot at Key West, Florida	4,832 97		4,832 97			4,832 97
Enlistment bounties to seamen	18,085 54		18,085 54			19,853 39
Surveying Isthmus of Darien for a ship-canal	5,000 00		5,000 00			8,507 97
Surveying Tehuantepec and Nicaragua ship-canal	22,897 59		22,897 59		2,490 96	20,406 63
Clothing, Navy	449,285 15		449,285 15		60,258 84	389,026 31
Naval hospital fund	102,297 30		102,297 30		28,387 26	73,910 04
Funeral expenses of the late Admiral David G. Farragut	2,000 00		2,000 00			2,000 00
Relief of the heirs, &c., of those lost in the Onaida					*240 00	
Indemnity for lost clothing					*670 00	
Relief of—						
The children of Otway H. Berryman and others		20,664 69	20,664 69		2,259 27	18,405 42
The children of Otway H. Berryman		2,160 02	2,160 02			2,160 02
Sarah A. Ward		5,000 00	5,000 00		5,000 00	
Mrs. R. A. Kennedy		739 00	739 00			739 00
Robert A. Mayo		1,507 59	1,507 59			1,507 59
Sarah S. Stafford		8,000 00	8,000 00			8,000 00
Total	1,975,385 54	38,071 30	2,013,456 84	5,275 82	173,425 51	1,846,217 15

INTERIOR—CIVIL.

Deposits by individuals for expenses of surveys of public lands			117,922 90		24,746 16	93,176 74
Payment to Standish & Ballard		1,000 00	1,000 00		1,000 00	
Relief of—						
Mrs. D. Jay Brown		250 00	250 00		250 00	
S. D. Houston				223 34		\$223 34
G. W. Sturtevant		100 00	100 00		100 00	
M. P. Hardin				200 73		200 73
Repayment for lands erroneously sold						
Five per cent. fund, net proceeds of sales of public lands in Minnesota					*5,232 89	
Three per cent. fund, net proceeds of sales of public lands in Missouri					*7,248 97	
Two per cent. fund, net proceeds of sales of public lands in Missouri					*538 41	
Five per cent. fund, net proceeds of sales of public lands in Nevada					*358 94	
Five per cent. fund, net proceeds of sales of public lands in Oregon					*26 32	
Five per cent. fund, net proceeds of sales of public lands in Wisconsin					*5,191 40	
Five per cent. fund, net proceeds of sales of public lands in Nebraska					*20,760 04	
Surveying the Saint Vrain and Vigil land-claim in Colorado					*78,377 12	
Total	117,922 90	1,350 00	119,272 90	93,600 81	143,925 95	186,777 55
						424 07

A.—Statement of balances of appropriations July 1, 1872, made for fiscal year ended June 30, 1872, &c.—Continued.

Appropriations.							
	Balances at commencement of current fiscal year, July 1, 1872.	Appropriations for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures for current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
INTERIOR—PENSIONS AND INDIANS.							
Fulfilling treaties with—							
Arikarees, Gros Ventres, and Mandans.....	\$76,332 54	\$75,000 00	\$76,332 54	.....	\$28,512 82	\$47,819 72	.....
Apaches, Kiowas, and Comanches.....	152,926 17	68,700 00	152,926 17	.....	31,302 33	121,623 84	.....
Apaches and Cheyennes, of Upper Arkansas River.....	29,912 22	.....	29,912 22	\$1,163 81	.....	1,422 67	.....
Assinaboines.....	33,406 44	30,000 00	33,406 44	.....	6,646 39	23,265 83	.....
Bannocks.....	42,600 00	50,000 00	42,600 00	.....	3,270 30	30,136 14	.....
Blackfeet, Bloods, and Piegiens.....	5,855 53	5,500 00	5,855 53	.....	21,134 13	21,465 87	.....
Calapooias, Molallas, and Clackamas, of Willamette Valley.....	14,038 56	.....	14,038 56	.....	2,750 00	3,105 53	.....
Chastats, Scotons, and Umpquas.....	95,259 94	49,700 00	95,259 94	.....	27,816 65	14,038 56	.....
Cheyennes and Arapahoes.....	3,000 00	3,000 00	3,000 00	.....	3,000 00	67,473 29	.....
Chickasaws.....	18,403 64	15,600 00	18,403 64	.....	11,579 18	6,824 46	.....
Chippewas, Boise Fort Band.....	48,413 03	31,220 00	48,413 03	.....	23,389 10	25,023 93	.....
Chippewas of Lake Superior.....	320 88	.....	320 88	.....	.....	320 88	.....
Chippewas of Lake Superior and the Mississippi.....	114,305 47	45,902 01	114,305 47	.....	37,970 19	76,335 28	.....
Chippewas of the Mississippi.....	.....	.....	.....	.....	.....	.....	.....
Chippewas of the Mississippi, and Pillagers, and Lake Winnebagoish bands of Chippewas.....	12,820 00	11,680 00	12,820 00	.....	6,020 00	6,740 00	.....
Chippewas, Pillager, and Lake Winnebagoish bands.....	31,621 55	25,666 66	31,621 55	.....	20,321 27	11,300 28	.....
Chippewas of Red Lake and Pembina tribe.....	47,305 11	35,790 00	47,305 11	.....	29,792 40	17,512 71	.....
Chippewas of Saginaw, Swan Creek, and Black River.....	25,932 33	.....	25,932 33	1,636 28	.....	27,568 61	.....
Choctaws.....	32,032 93	30,032 89	32,032 93	.....	15,016 44	17,016 49	.....
Confederated bands and tribes in Middle Oregon.....	28,294 24	13,603 00	28,294 24	.....	7,198 58	21,095 66	.....
Creeks.....	94,571 94	74,778 40	94,571 94	.....	37,115 03	57,456 91	.....
Crows.....	308,687 35	198,223 00	308,687 35	.....	62,456 74	246,230 61	.....
Delawares.....	41,989 41	2,404 00	41,989 41	.....	.....	41,989 41	.....
D'Wamish and other allied tribes in Washington.....	14,778 60	14,100 00	14,778 60	.....	7,036 26	7,742 34	.....
Flathead and other confederated tribes.....	65,905 50	20,000 00	65,905 50	.....	12,249 82	53,655 68	.....
Gros Ventres.....	35,106 35	35,000 00	35,106 35	.....	6,354 92	28,751 43	.....
Iowas.....	4,347 70	2,875 00	4,347 70	.....	362 15	3,985 55	.....
Kansas.....	12,025 00	10,000 00	12,025 00	.....	.....	12,025 00	.....
Kickapoos.....	18,173 04	10,000 00	18,173 04	.....	7,500 00	10,673 04	.....
Klamath and Modocs.....	31,800 28	17,100 00	31,800 28	.....	8,550 00	23,250 28	.....
Makahs.....	16,615 87	18,600 00	16,615 87	.....	4,300 00	12,315 87	.....

Menomonee	5,947 86	16,179 06	5,947 86		56,158 26		
Miamies of Kel River	2,928 23	1,100 00	2,928 23		1,100 00		1,128 23
Miamies of Indiana	23,883 37	11,062 89	23,883 37		11,062 12		12,261 25
Miamies of Kansas	27,353 65	11,540 00	27,353 65		7,124 95		20,228 70
Molela	13,923 07	13,000 00	13,923 07		2,690 51		11,232 56
Mixed Shoshones, Bannocks, and Sheep-Eaters	35,464 93	25,000 00	35,464 93		16,398 59		19,066 34
Navajoes	336,421 42	66,000 00	336,421 42		18,112 88		318,308 54
Nez Percés	142,920 13	37,300 00	142,920 13		31,949 01		110,971 12
Nisquallies, Payallups, and other tribes and bands	9,430 79	9,200 00	9,430 79		4,600 00		4,830 79
Northern Cheyennes and Arapahoes	298,143 49	38,000 00	298,143 49		20,716 86		277,426 63
Omahas	29,505 92	24,500 00	29,505 92		16,025 00		13,480 92
Osages	25,380 41	18,456 00	25,380 41				25,380 41
Ottawas of Blanchard's Fork and Roche de Beuf				1,000 00			1,000 00
Ottawas and Chippewas of Michigan	15,225 82		15,225 82				15,225 82
Ottos and Missourias	9,519 20	19,000 00	9,519 20		4,479 49		5,039 71
Pawnees	77,588 83	59,180 00	77,588 83		38,560 27		39,028 56
Poncas	27,500 00	27,500 00	27,500 00		11,482 97		16,017 03
Pottawatemies	107,266 77	90,440 97	107,266 77		48,200 00		59,066 77
Pottawatemies of Huron	400 00	400 00	400 00				
Quapaws	5,195 67	2,660 00	5,195 67		1,660 00		3,535 67
Qui-nai-utes and Quil-leh-utes	18,408 69	8,100 00	18,408 69		4,050 00		14,358 69
River Crows	30,000 00	30,000 00	30,000 00		6,318 52		23,681 48
Rogue Rivers	10,795 52	13,000 00	10,795 52		1,500 00		9,295 52
Sacs and Foxes of the Mississippi	117,781 57	52,950 00	117,781 57				119,747 08
Sacs and Foxes of the Missouri	9,885 49	7,870 00	9,885 49		4,513 00		5,372 49
Seminoles	38,500 00	28,500 00	38,500 00		14,250 00		24,250 00
Shoshones, Eastern, Western, Northwestern, and Goship bands	39,124 63	21,000 00	39,124 63		12,405 81		26,718 82
Senecas	2,660 00	2,660 00	2,660 00				
Senecas of New York	23,846 26	11,902 50	23,846 26		11,902 50		11,943 76
Senecas and Shawnees	2,225 00	2,060 00	2,225 00		2,060 00		165 00
Shawnees	12,370 89	5,000 00	12,370 89				12,630 48
Shoshones and Bannocks, and other bands in Idaho and Southwestern Oregon	149 55		149 55				
Shoshones and Bannocks	217,210 65	98,411 00	217,210 65		27,180 88		190,029 77
Six Nations of New York	9,745 16	14,500 00	9,745 16		3,381 14		6,364 02
Sioux of Dakota, Blackfeet, Lower Brulé, and other bands	2,676 65		2,676 65				2,676 65
Sioux of different tribes, including Santee Sioux, of Nebraska	1,998,312 07	1,872,300 00	1,998,312 07		725,383 04		1,272,929 03
Sisseton and Wahpeton, and Santee Sioux, of Lake Traverse and Devil's Lake	86,870 09	75,000 00	86,870 09		32,142 03		54,728 01
Sioux, Yankton tribe	67,448 15	41,503 00	67,448 15		39,905 42		27,542 73
S'Klallams	13,886 62	10,000 00	13,886 62		4,993 00		8,893 62
Snakes, Wall-pah-pe tribe	7,330 30	1,200 00	7,330 30		1,000 00		6,330 30
Senecas, Shawnees, Quapaws, Peorias, Ottawas, Wyandotts, and others	4,997 29	21,623 29	4,997 29		1,578 92		3,418 37
Umpquas, Cow Creek band	1,712 76	1,550 00	1,712 76		275 00		1,437 76
Umpquas and Calapooias of Umpqua Valley, California	17,127 63	2,450 00	17,127 63		1,459 50		15,668 13
Tabaquache, Muache, Cayote, Weminuche, Yampa, Grand River, and Uintah Utes	145,180 60	78,220 00	145,180 60		40,086 83		105,093 77
Utahs, Tal-ejuache band	123,067 25	22,720 00	123,067 25				123,067 25
Walla-Walla, Cayuse, and Umatilla tribes	28,898 56	19,700 00	28,898 56		9,850 00		19,048 56
Winnabagoes	101,317 56	65,103 68	101,317 56		51,903 75		49,413 81
Wyandotts	16,703 56	16,703 56	16,703 56		16,703 56		
Yakamas	32,465 62	25,400 00	32,465 62		12,200 00		20,265 62

A.—Statement of balances of appropriations July 2, 1872, made for fiscal year ended June 30, 1872, &c.—Continued.

Appropriations.	Balances at commencement of current fiscal year, July 1, 1872.	Appropriations for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures for current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
INTERIOR—PENSIONS AND INDIANS—Continued.							
Fulfilling treaties with—							
Cherokees, proceeds of land.....	\$100 80	.....	\$100 80	\$1, 441 63	.....	\$1, 542 43	.....
Chippewas and Christian Indians, proceeds of land.....	.....	.....	.....	16 36	.....	16 36	.....
Creeks, proceeds of land.....	.....	.....	.....	8 99	.....	8 99	.....
Chickasaws, proceeds of land.....	.....	.....	.....	53 38	.....	53 38	.....
Iowas, proceeds of land.....	18 00	.....	18 00	.....	.....	18 00	.....
Kansas, proceeds of land.....	.....	\$7, 563 09	7, 563 09	.....	\$7, 557 30	5 79	.....
Kaskaskias, Peorias, Weas, and Piankeshaws, proceeds of land.....	83 35	.....	83 35	36 00	.....	83 71	.....
Kickapos, proceeds of land.....	247 78	.....	247 78	1 08	.....	248 86	.....
Menomonees, proceeds of land.....	221 44	.....	221 44	.....	.....	221 44	.....
Ottawas, of Blanchard's Fork and Roche de Beuf, proceeds of land.....	.....	.....	.....	1 67	.....	1 67	.....
Pottawatomies, proceeds of land.....	14, 232 33	.....	14, 232 33	.....	.....	14, 232 33	.....
Stockbridges, proceeds of land.....	1, 000 00	.....	1, 000 00	.....	.....	1, 000 00	.....
Sacs and Foxes of the Mississippi, proceeds of land.....	983 65	.....	983 65	.....	.....	983 65	.....
Sacs and Foxes of the Missouri, proceeds of land.....	131 42	.....	131 42	.....	.....	131 42	.....
Senecas and Shawnees, proceeds of land.....	.....	.....	.....	2 24	.....	2 24	.....
Shawnees, proceeds of land.....	77 71	.....	77 71	.....	.....	77 71	.....
Winnebagoes, proceeds of land.....	1, 037 11	.....	1, 037 11	.....	.....	1, 037 11	.....
Osages, proceeds of trust-lands.....	404, 904 05	71, 214 71	476, 118 76	.....	.....	476, 118 76	.....
Interest due—							
Cherokee national fund.....	9, 720 28	{ 18, 320 00	23, 184 88	.....	22, 239 00	945 88	.....
Cherokee school-fund.....	9, 846 72	{ 13, 464 60	23, 586 51	.....	22, 887 24	699 27	.....
Cherokee orphan-fund.....	3, 203 62	{ 2, 230 00	8, 521 63	.....	8, 412 29	109 34	.....
Chickasaw incompetents' fund.....	1, 150 00	{ 13, 739 79	1, 150 00	.....	.....	1, 150 00	.....
Chickasaw national fund.....	31, 830 94	{ 100 00	56, 711 10	.....	47, 190 94	9, 520 16	.....
Chippewas and Christian Indians.....	173 97	{ 15, 140 00	1, 393 64	.....	.....	1, 393 64	.....
Choctaw general fund.....	27, 055 63	{ 24, 880 16	27, 144 25	.....	27, 055 63	88 62	.....
Choctaw school-fund.....	890 00	{ 27, 000 00	1, 966 38	.....	890 00	1, 076 38	.....
Creek orphans' fund.....	5, 065 28	{ 88 62	5, 209 52	.....	3, 208 89	2, 000 63	.....

Delaware general fund	20,989 87	{	19,710 00	26,673 86	.....	315 00	26,358 86	.....
Delaware school-fund	4,251 57	{	5,683 99	4,408 99	.....	.....	4,408 99	.....
Iowa	9,053 43	{	12,800 00	10,230 78	.....	8,887 04	1,343 74	.....
Kansas schools	428 40	{	1,177 35	1,136 29	.....	926 35	209 94	.....
Kaskaskias, Peorias, Weas, and Plankeshaws, school-fund	2,289 00	{	1,449 00	3,129 00	.....	.....	3,129 00	.....
Kaskaskias, Peorias, Weas, and Plankeshaws	7,138 38	{	3,721 00	7,176 35	.....	200 00	6,976 35	.....
Kickapoos, general fund	5,064 76	{	1,966 34	7,031 10	.....	.....	7,031 10	.....
Menomonees	1,510 56	{	1,950 00	3,590 04	.....	1,500 00	2,090 04	.....
Osage schools	2,256 75	{	2,079 48	2,953 33	.....	565 89	2,387 44	.....
Ottawas and Chippewas	26,517 49	{	230 00	26,907 65	.....	.....	26,907 65	.....
Ottawas, of Blanchard's Fork and Roche de Beuf	437 93	{	390 16	1,163 86	.....	437 93	725 93	.....
Pottawatomes, education	19,173 17	{	3,350 00	19,539 48	.....	5,815 31	13,724 17	.....
Pottawatomes, mills	4,837 52	{	286 22	5,123 74	.....	5,114 90	8 84	.....
Pottawatomes, general fund	3,746 00	{	724 27	3,746 00	.....	.....	37 46	.....
Sacs and Foxes, of Missouri	1,731 87	{	588 95	2,456 14	.....	166 39	2,289 75	.....
Senecas	577 05	{	1,163 00	1,163 00	.....	1,163 00	.....	.....
Senecas, Tonawanda band	10,675 06	{	1,244 34	11,919 40	.....	5,810 15	6,109 25	.....
Senecas and Shawnees	1,131 78	{	389 47	1,521 25	.....	1,000 00	521 25	.....
Shawnees	333 66	{	68 84	402 50	.....	.....	402 50	.....
Stockbridges and Munsees	169 56	{	85 87	255 43	.....	169 56	85 87	.....
Proceeds Pottawatome trust-bonds	797 24	{	.....	797 24	.....	.....	797 24	.....
Trust-fund stocks, redeemed, due Cherokee school-fund	1,657 47	{	.....	1,657 47	.....	.....	86 95	.....
Trust-fund stocks, redeemed, due Creek orphans .....	.....	{	.....	.....	.....	.....	1,657 47	.....
Incidental expenses, Indian service, in—	.....	{	.....	.....	.....	.....	.....	.....
Arizona	75,073 22	{	75,000 00	75,073 22	.....	40,173 08	34,900 14	.....
California	85,240 27	{	85,000 00	85,240 27	.....	41,838 09	43,402 18	.....
Colorado	12,717 44	{	10,000 00	12,717 44	.....	4,256 71	8,460 73	.....
Dakota	17,733 99	{	20,000 00	17,733 99	.....	5,282 69	12,451 30	.....
Idaho	23,322 53	{	20,000 00	23,322 53	.....	1,583 92	21,738 61	.....
Montana	24,951 38	{	25,000 00	24,951 38	.....	15,417 12	9,534 26	.....
Nevada	16,094 18	{	15,000 00	16,094 18	.....	9,425 98	6,668 20	.....
New Mexico	49,648 43	{	50,000 00	49,648 43	.....	14,042 26	35,606 17	.....
Oregon and Washington	13,844 56	{	.....	13,844 56	.....	622 88	13,221 68	.....
Oregon	41,143 36	{	40,000 00	41,143 36	.....	20,785 91	20,357 45	.....
Utah	35,646 57	{	25,000 00	35,646 57	.....	17,858 48	17,788 09	.....
Washington	24,444 08	{	24,400 00	24,444 08	.....	13,406 63	11,037 45	.....
Wyoming	9,153 66	{	5,000 00	9,153 66	.....	843 66	8,310 00	.....
Pay of—	.....	{	.....	.....	.....	.....	.....	.....
Superintendents and Indian agents	227,561 51	{	121,100 00	227,561 51	.....	44,023 99	183,537 52	.....
Special agents	3,354 40	{	1,500 00	3,354 40	.....	375 00	2,979 40	.....
Sub-agents	35,067 53	{	3,000 00	35,067 53	.....	1,000 00	34,067 53	.....
Interpreters	37,153 68	{	40,500 00	37,153 68	.....	14,083 95	23,069 73	.....
Temporary clerks to superintendents	11,013 97	{	6,600 00	11,013 97	.....	1,467 33	9,546 64	.....
Clerk to superintendent at Saint Louis	117 59	{	.....	117 59	.....	.....	117 59	.....
Clerk to superintendent in California	3,236 11	{	1,800 00	3,236 11	.....	900 00	2,336 11	.....

A.—Statement of balances of appropriations July 1, 1872, made for fiscal year ended June 30, 1872, &c.—Continued.

Appropriations.	Balances at commencement of current fiscal year, July 1, 1872.	Appropriated for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures for current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
INTERIOR—PENSIONS AND INDIANS—Continued.							
Support of schools not otherwise provided for	\$83,872 91		\$83,872 91		\$21,537 50	\$62,335 41	
Support of schools, farms, &c., for Apaches, Kiowas, and Comanches	4,805 53		4,805 53		300 00	4,505 53	
Support and civilization of the Teton Sioux	498,500 00	\$500,000 00	498,500 00		239,729 38	258,770 62	
Contingencies of the Indian Department	44,685 94	\$50,000 00	44,685 94		15,700 78	28,985 16	
Contingencies of trust-funds	3,000 00	\$3,000 00	3,000 00		1,145 54	1,854 46	
Civilization of—							
Indians	18,533 77	10,000 00	28,533 77		5,670 89	22,862 88	
Indians in central superintendency	11,000 00		11,000 00			11,000 00	
Winnebagoes		100,000 00	100,000 00		30,308 05	69,691 95	
Indians on White Earth reservations	25,000 00	\$25,000 00	25,000 00		25,000 00		
Presents to Indians	670 01		670 01		670 01		
Provisions for Indians	2,383 91		2,383 91		196 00	2,187 91	
Presents and provisions for Indians	13,889 81	\$10,000 00	13,889 81		4,218 40	9,671 41	
Vaccination of Indians	7,534 88	\$5,000 00	7,534 88		450 00	7,084 88	
Buildings at agencies, and repairs	20,920 17	\$10,000 00	20,920 17		1,205 65	19,714 52	
Rescuing prisoners from Indians	14,304 43	\$5,000 00	14,304 43		294 62	14,009 81	
Holding a general council of Cherokee, Creek, Seminole, Choctaw, and Chickasaw Indians	15,069 60	\$14,000 00	15,069 60			15,069 60	
Medallions of the President for distribution to Indians	1,168 70		1,168 70			1,168 70	
Expenses—							
Of the commissioner on the condition and treatment of Indians	37 70		37 70			37 70	
Of Indian commissioners	20,300 00	\$15,000 00	20,300 00		1,236 25	19,063 75	
Under treaties made by Indian peace commission				\$359 22		359 22	
Of Indian delegation visiting Washington	16,753 79		16,753 79		16,409 30	344 49	
Intercourse with Indian tribes having no treaties with the United States	61 56		61 56		61 56		
Loss and destruction of property of citizens of Minnesota and Iowa at Spirit Lake	5,322 71		5,322 71			5,322 71	
Payments for improvements made by claimants on Rogue River reservation	309 33		309 33			309 33	
Pay of agents and employes, supplies and expenses of Flathead and Blackfoot agencies, Montana	8 01		8 01			8 01	
Payment—							
To R. H. Taylor, for herding cattle	331 97		331 97			331 97	
Of indebtedness left by Charles Maltby, late superintendent of Indians in California	2,072 44		2,072 44			2,072 44	

Of deficiencies incurred by Austin Wiley, late superintendent of Indian service in California.....	2,371 03	2,371 03			2,371 03
To Pottawatomie citizens.....	3,339 06	3,339 06			3,339 06
To receivers for incompetent or orphan Indians.....	2,243 46	2,243 46			2,243 46
Preventing trespasses and depredations by Indians.....	377 52	377 52			377 52
Replacing goods and supplies lost or destroyed.....	20,000 00	20,000 00			20,000 00
Buildings for Choctaw and Chickasaw agency.....	5,000 00	5,000 00			5,000 00
Payment to citizens of Nebraska for damages by removing Santee Sioux.....	3,387 07	3,387 07			3,387 07
Maintaining peace with the various tribes and bands of Indians.....	5,940 98	5,940 98		329 67	5,611 31
Colonizing and supplying the Wichita and other affiliated bands.....	47,365 10	47,365 10		19,488 63	27,876 47
Collecting and subsisting the Apaches of Arizona and New Mexico.....	255,125 85	255,125 85		92,968 73	162,157 12
Collecting and subsisting roving bands of Kickapoos and other Indians on the borders of Texas and Mexico.....	61,103 26	61,103 26	1 37		61,104 63
Collecting and locating Colorado River Indians in Arizona.....	10,000 00	10,000 00			10,000 00
Presents to bands of Pueblo Indians in New Mexico.....	103 45	103 45			103 45
Indian service in district of country leased from Choctaws.....	38 67	38 67			38 67
Removal—					
Of stray bands of Winnebagoes and Pottawatomies in Wisconsin.....	36,000 00	36,000 00			36,000 00
Of Sioux Indians beyond the limits of any State.....	543 72	543 72	26 15		569 87
And settlement of bands of Chippewa Indians of Lake Superior. (Reimbursable).....	75,000 00	75,000 00			75,000 00
Of the Flathead Indians.....	6,000 00	6,000 00		6,000 00	
And subsistence of Indians in Oregon and Washington.....	11,407 23	11,407 23			11,407 23
And settlement of Indians in Uintah Valley, California.....	80	80	14 25		15 05
Settlement, subsistence, and support of Navajo Indians captured in New Mexico.....	6,168 61	6,168 61		820 94	5,347 67
Subsistence of the Kaw Indians in Kansas. (Reimbursable).....	7,800 00	7,800 00			7,800 00
Subsisting the Sioux Indians on the Milk River reservation.....	150,000 00	150,000 00		21,867 30	128,132 70
Settlement, subsistence, and support of Shoshones, Bannocks, and other bands in Idaho and Southeastern Oregon.....	39,059 00	39,059 00		28,435 31	10,623 69
Subsistence—					
Of Red Cloud's band of Sioux Indians.....	165,000 00	165,000 00		133,276 97	31,723 03
And clothing of Sisseton, Wabpeton, Medawakauton, and Wabpakoota Sioux.....	1,842 53	1,842 53	796 39		2,638 92
And clothing and civilization of Indians in Uintah Valley, Utah.....	10,000 00	10,000 00		10,000 00	
Of friendly Indians.....	2,058 25	2,058 25	9 62		2,067 87
Of Great and Little Osage. (Reimbursable).....	74,000 00	74,000 00		15,000 06	59,000 00
Of Arapahoes, Cheyennes, Apaches, Kiowas, Comanches, and Wichitas.....	199,576 48	199,576 48		86,492 46	113,084 02
Survey of exterior boundaries of Indian reservations.....	242,357 48	242,357 48		92,357 48	150,000 00
Survey of Indian reservations.....	55,100 00	55,000 00			55,000 00
Surveying and allotting lands to the Indians at Grande Ronde reservation, Oregon.....	1,716 40	1,716 40		1,139 71	576 69
Locating the 96th meridian, from Kansas to the Creek country.....	5,000 00	5,000 00			5,000 00
Proceeds of Winnebago reservation in Minnesota.....	360 00	810 00		45 18	764 82
Proceeds of Sioux reservation in Minnesota and Dakota.....	165,550 99	175,535 39		3,970 55	171,564 84
Insurance, transportation, and delivery of annuities and provisions to—					
Blackfeet Indians.....	1,319 45	1,319 45		118 20	1,201 25
Chippewas of Lake Superior.....	418 55	418 55			418 55
Chippewas of the Mississippi.....			10 48		10 48
Pawnees, Poncas, and Yankton Sioux.....	35,366 05	35,366 05			35,366 05
Indians in Minnesota and Michigan.....	5,578 09	5,578 09		2,980 00	2,598 09
Wagon-roads in Idaho, Montana, Dakota, and Nebraska.....	5,122 86	5,122 86			5,122 86

A.—Statement of balances of appropriations July 1, 1872, made for fiscal year ended June 30, 1872, &c.—Continued.

Appropriations,	Balances at commencement of current fiscal year, July 1, 1872	Appropriations for the service of the current fiscal year.	Available for the service of the current fiscal year.	Repayments in excess of expenditures for current fiscal year.	Expended during first quarter of current fiscal year.	Estimated amounts required for remaining three quarters of the fiscal year.	Amounts which may be carried to the surplus fund.
	\$178, 152 79 4, 937 50	 \$277, 357 45	||\$113, 052 78 4, 937 50	 \$2, 857 33	 2, 989, 076 61	\$113, 052 78 4, 875 00	..... ..... .....
INTERIOR—PENSIONS AND INDIANS—Continued.							
Navy pension fund							
Maintenance and education of Helen and Heloise Lincoln							
Total Interior, Pensions, and Indians	9, 922, 890 67	\$277, 357 45	10, 135, 148 12	\$2, 857 33	2, 989, 076 61	7, 155, 139 24	.....

NOTES TO TABLE A.

* These accounts belong to the class known as "indefinite," and therefore no balances can appear. The amounts expended are credited to the accounts at the close of the year.

† War, \$16,000. This is an apparent and not an actual overdraft. The amount of the appropriation was advanced to a disbursing-officer and repaid back to the Treasury, and again drawn out before it appeared as a credit upon the books from which these balances were taken.

‡ Interior Indian appropriations. These amounts were appropriated May 20, 1872, and placed to the credit of these appropriations June 24, 1872, and are merged in the balances of June 30, 1872, or have been drawn against, not being limited by law to fiscal years.

§ This amount was erroneously carried to the surplus fund. A re-appropriation has been requested to balance the account.

|| Navy pension fund. \$65,100 were transferred by appropriation warrant under act of Congress to an account for support of the naval asylum at Philadelphia, thereby reducing the available balance by this amount.

B.—Statement of balances of appropriations July 1, 1872, made for the service of the fiscal year ended June 30, 1871, and prior years, limited by the terms of the 5th section of the act of July 12, 1870, (16 Stat., 251,) to the service of the year for which the appropriations were made, together with a statement of the amounts expended during the first quarter of the current fiscal year, and the amounts which may be carried to the surplus fund.

Appropriations.				
	Balances unexpended June 30, 1872.	Net expenditures during quarter ended September 30, 1872.	Excess of repayments during the quarter ended September 30, 1872.	Amounts which may be carried to the surplus fund.
TREASURY.				
Clerks to committees, pages, horses, &c., for the Senate.....	.....	.....	\$230 40	\$230 40
Expenses of heating and ventilating apparatus for the Senate .....	.....	.....	214 00	214 00
Expenses of the Joint Committee on Retrenchment of the Senate .....	.....	.....	416 09	416 09
Blank-books, stationery, &c., office of Public Printing	\$500 00	.....	.....	500 00
Pay of attorneys, &c., Court of Claims.....	1, 141 14	\$1, 141 14	.....	.....
Compensation of the President of the United States.....	20 00	.....	.....	20 00
Compensation of the Vice-President of the United States.....	100 00	.....	.....	100 00
Alterations of the Treasury Building.....	330 34	2 50	.....	327 84
Compensation of the Secretary of the Treasury, Assistant Secretaries, clerks, messengers, &c., in his office.....	.....	.....	836 65	836 65
Compensation of the Fifth Auditor of the Treasury, clerks, messengers, &c., in his office.....	150 00	.....	.....	150 00
Compensation of the Secretary of the Navy, clerks, messengers, &c., in his office.....	297 00	.....	.....	297 00
Steamship service between San Francisco and the Sandwich Islands	12, 500 00	.....	.....	12, 500 00
Overland mail transportation between Atchison and Folsom, and marine mail transportation between New York and California.....	68, 044 03	.....	.....	68, 044 03
Mail steamship service between San Francisco, Japan, and China.....	625, 000 00	.....	.....	625, 000 00
Supplying deficiencies in the revenues of the Post-Office Department.....	3, 618, 396 00	.....	.....	3, 618, 396 00
Department of Agriculture, deficiency of pay of certain employes.....	9 90	.....	.....	9 90
Fuel, labor, &c., office of Attorney-General .....	.....	.....	17 08	17 08
Expenses of defending suits in relation to captured and abandoned property.....	45, 611 88	.....	.....	45, 611 88
Compensation and mileage of members of legislative assembly, Territory of Arizona.....	1, 905 19	.....	.....	1, 905 19
Compensation and mileage of members of legislative assembly, Territory of Colorado.....	1, 478 46	.....	6, 811 46	8, 289 92
Salaries, government of the District of Columbia.....	1, 125 99	.....	.....	1, 125 99
Compensation of governor, judges, &c., Territory of Dakota.....	10 00	.....	.....	10 00
Compensation and mileage of members, &c., Territory of Dakota.....	194 09	.....	.....	194 09
Compensation and mileage of members, &c., Territory of Idaho	220 39	.....	.....	220 39
Contingent expenses, Territory of Idaho	657 08	470 00	.....	187 08
Compensation and mileage of members, &c., Territory of Montana.....	.....	.....	1, 913 05	1, 913 05
Compensation and mileage of members, &c., Territory of New Mexico.....	1, 350 82	1 350 82	.....	.....
Contingent expenses, Territory of Utah	606 25	.....	.....	606 25
Contingent expenses, Territory of Washington.....	428 96	.....	178 46	607 42
Contingent expenses, act August 6, 1846.....	42, 303 11	.....	36 24	42, 339 35

UNEXPENDED BALANCES OF APPROPRIATIONS.

B.—Statement of balances of appropriations July 1, 1872, made for the service of the fiscal year ended June 30, 1871, &c.—Continued.

Appropriations.				
	Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during quarter end- ed September 30, 1872.	Amounts which may be carried to the surplus fund.
TREASURY—Continued.				
Plates, paper, special dies, &c., for office of Comptroller of the Currency.....	\$83, 146 82	\$18, 238 96	.....	\$64, 907 86
Compensation of officers, clerks, &c., of the United States Mint at Philadelphia.....	.....	.....	\$100 64	100 64
Wages of workmen, United States Mint at Philadelphia.....	49 50	.....	.....	49 50
Incidental and contingent expenses, United States Mint at Philadelphia.....	24 75	.....	36, 178 56	36, 203 31
Transportation of bullion, United States Mint at Philadelphia.....	.....	.....	2, 876 51	2, 876 51
Specimens of ores and coins, United States Mint at Philadelphia.....	.....	.....	418 80	418 80
Branch mint at Carson City, pay of superintendent, officers, and clerks.....	3, 000 00	.....	2, 571 03	5, 571 03
Branch mint at Carson City, wages of workmen.....	3, 799 05	.....	1, 904 21	1, 904 21
Branch mint at Carson City, incidental and contingent expenses.....	8, 932 89	.....	.....	3, 799 05
Branch-mint building, Carson City.....	6, 720 00	.....	.....	8, 932 89
Branch mint, Dallas City, Oregon, establishment of.....	166 71	.....	.....	6, 720 00
Construction of assay office at Boise City, Idaho.....	239, 176 64	5, 000 00	.....	166 71
Branch mint at San Francisco, purchase of a site and erection of a building.....	.....	.....	.....	234, 176 64
Vault, safes, and locks for public buildings.....	.....	.....	135 61	135 61
Court-house and post-office at—	.....	.....	.....	.....
Springfield, Illinois.....	3, 000 00	.....	.....	3, 000 00
Portland, Maine.....	216 50	.....	.....	216 50
Des Moines, Iowa.....	372 31	372 31	.....	.....
Omaha, Nebraska.....	27, 200 96	27, 200 96	.....	.....
Smithsonian Institution.....	448, 358 49	.....	.....	448, 358 49
Unprovided claims.....	10, 311 45	.....	.....	10, 311 45
To make good interest on stocks of the State of Arkansas, held in trust by the Secretary of the Treasury for the Chickasaw Indians.....	5, 400 00	.....	.....	5, 400 00
Payment of such creditors of Texas as are comprehended in the act of September 9, 1850.....	101, 113 27	.....	.....	101, 113 27
Expenses incurred in the prosecution and collection of claims.....	.....	.....	02	02
Expenses of United States courts.....	654, 968 40	.....	6, 507 28	661, 475 68
Pay of cashier, clerks, &c., in office of United States depository at Louisville.....	.....	.....	28 64	28 64
Salaries of assistant treasurers United States.....	201 00	201 00	.....	.....
Expenses of collection and disposition of captured and abandoned property.....	4, 789 71	250 00	.....	4, 539 71
To enable the Light-House Board to re-establish lights on the southern coast.....	323 83	.....	.....	323 83
Construction of revenue-cutters.....	20, 779 64	15, 709 90	.....	5, 069 74
Custom-house, &c., at—	.....	.....	.....	.....
Bangor, Maine.....	15 66	.....	.....	15 66
Nashville, Tennessee.....	94, 771 90	.....	.....	94, 771 90

Cairo, Illinois.....	10,000 00	10,000 00	.....	.....	.....
Portland, Oregon.....	13,675 20	13,675 20	.....	.....	.....
Sandusky, Ohio.....	.....	.....	1,170 14	1,170 14	.....
Revenue-culter service.....	.....	.....	7,958 83	345,430 46	.....
Purchase of furniture and fixtures for accommodation of revenue-officers, custom-house, Savannah, Georgia.....	.....	.....	28 06	254 44	.....
Improving rooms, custom-house, Savannah, Georgia.....	.....	.....	254 44	6,263 72	.....
Salaries of light-house keepers.....	5,733 52	.....	530 20	129 25	.....
Repairs and incidental expenses of refitting and improving fog-signals, and buildings connected therewith.....	129 25	.....	.....	687 51	.....
Expenses of buoyage.....	436 69	.....	250 82	921 60	.....
Repairs and incidental expenses of light-houses.....	766 30	.....	155 30	242 43	.....
Seamen's wages, repairs and supplies of light-boats.....	749 48	507 05	.....	69 60	.....
Bridgeport beacon-light, Connecticut.....	.....	.....	69 60	2 76	.....
Light-vessel, Martin's Industry, South Carolina.....	.....	.....	.....	.....	.....
Rebuilding light-house tower and keeper's dwelling at Saint Simons, Georgia.....	16,455 04	16,455 04	.....	.....	.....
Light-house on Alligator Reef, Florida.....	20 00	.....	.....	.....	.....
Light-house at the mouth of Calcasieu River, Louisiana.....	7,220 08	.....	.....	.....	.....
Iron light-house at Southwest Pass, Louisiana.....	.....	.....	150 00	.....	.....
Light-house on Spectacle Reef, Lake Huron, Michigan.....	14,741 95	.....	.....	.....	.....
Light-house at Punta de los Reyes, California.....	4,820 55	4,597 45	.....	.....	.....
Light-house at Punta Arenas, California.....	8,153 08	.....	.....	.....	.....
Light-house at Trinidad Bay, California.....	.....	.....	10 28	.....	.....
Supplies of light-houses.....	13,416 89	9,305 12	.....	.....	.....
Light-house at Cape Blanco, Oregon.....	.....	.....	4 45	.....	.....
Marine hospital establishment.....	121,028 97	.....	2,841 48	.....	.....
Contingent expenses of life-saving stations on the coast of Long Island and New Jersey.....	3 38	3 38	.....	.....	.....
Repairs of marine hospital at Louisville, Kentucky.....	.....	.....	4 40	.....	.....
Assessing and collecting internal revenue, prior to July 1, 1871.....	1,044,182 40	33,573 73	.....	.....	.....
Punishment for violation of internal-revenue laws, prior to July 1, 1871.....	68,051 88	2,350 00	.....	.....	.....
Repairs of Government buildings in San Francisco, prior to July 1, 1871.....	522 50	.....	.....	.....	.....
Salaries of United States ministers.....	50,345 11	.....	.....	50,345 11	.....
Salary of private amanuensis of minister to Great Britain.....	1,180 00	1,180 00	.....	.....	.....
Salaries of United States secretaries of legation.....	10,506 14	.....	.....	.....	.....
Expenses of the execution of the neutrality act.....	19,550 00	5,000 00	.....	.....	.....
Contingent expenses of all missions abroad.....	2,872 24	.....	.....	.....	.....
Contingent expenses of foreign missions.....	28,285 79	.....	.....	.....	.....
Interpreters, guards, &c., consulate at Constantinople.....	1,495 13	.....	.....	.....	.....
Salaries of the interpreters to the consulates in China, Japan, and Siam.....	9,594 41	.....	.....	.....	.....
Salaries of the commissioner and consul-general to Hayti and Dominica.....	14,221 69	.....	.....	.....	.....
Salaries of the marshals of the consular courts in China, Japan, Siam, and Turkey.....	7,416 66	.....	.....	.....	.....
Rescuing citizens of the United States from shipwreck.....	9,375 00	.....	.....	.....	.....
Expenses of the Universal Exhibition at Paris.....	901 95	.....	.....	.....	.....
Awards under convention between United States and Peru.....	2,038 79	.....	.....	.....	.....
Awards under convention with the King of the French.....	4,945 94	.....	.....	.....	.....
Awards under convention with the Mexican Republic.....	2,250 47	.....	.....	.....	.....
Awards under convention with the Emperor of Brazil.....	8,741 78	.....	.....	.....	.....
Awards under the fifteenth article between the United States and Mexico.....	207,449 37	.....	.....	.....	.....
Claims on Spain.....	2,427 31	.....	.....	.....	.....
Awards under convention between United States and Peru.....	2,852 00	.....	.....	.....	.....
Repairs of cemetery fences and sexton's house belonging to United States in the City of Mexico.....	28 64	.....	.....	.....	.....
Relief and protection of American seamen.....	44,620 43	201 94	.....	.....	.....
Contingent expenses, United States consuls.....	1,946 98	.....	14 55	.....	.....
Salaries of United States consuls.....	55,278 28	1,411 18	.....	.....	.....

UNEXPENDED BALANCES OF APPROPRIATIONS.

B.—Statement of balances of appropriations July 1, 1872, made for the service of the fiscal year ended June 30, 1871, &c.—Continued.

Appropriations.				
	Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during quarter end- ed September 30, 1872.	Amounts which may be carried to the surplus fund.
TREASURY—Continued.				
Expenses of defending claims under convention with Mexico.....	\$13,728 25	.....	.....	\$13,728 25
Rent of prisons for American seamen in Japan, China, &c.....	1,831 10	.....	.....	1,831 10
Total, Treasury.....	\$8,310,682 36	\$168,197 66	\$74,820 04	\$8,217,304 74
WAR.				
Pay of the Army.....	4,436,480 20	175,981 08	.....	4,260,499 12
Subsistence of officers.....	1,044,142 99	164 82	.....	1,043,978 17
Forage for officers' horses.....	594,135 93	.....	2 50	594,138 43
Pay in lieu of clothing for officers' servants.....	216,393 41	.....	.....	216,393 41
Pay to discharged soldiers for clothing not drawn.....	385,518 19	136 18	.....	385,382 01
Pay of officers, instructors, &c., Military Academy.....	464,610 67	.....	267 73	464,878 40
Subsistence of officers, instructors, &c., Military Academy.....	14,706 58	.....	.....	14,706 58
Forage for officers' horses, Military Academy.....	7,422 78	.....	.....	7,422 78
Pay in lieu of clothing for officers' servants, Military Academy.....	246 54	.....	.....	246 54
Pay of two and three years' volunteers.....	143,876 92	136,526 95	.....	7,349 97
Bounty to volunteers, their widows, and legal heirs.....	3,514,430 29	287,600 98	.....	3,226,829 31
Pay of militia and volunteers.....	283,136 17	.....	.....	283,136 17
Pay and bounty to officers and men in Department of Missouri.....	188,982 03	.....	.....	188,982 03
Pay and support of the one-hundred-day volunteers.....	4,274,877 68	.....	.....	4,274,877 68
Mexican hostilities.....	199 06	.....	.....	199 06
Pay of volunteers.....	7 10	.....	.....	7 10
Subsistence of the Army.....	6,254,689 90	17,846 34	.....	6,236,843 56
Regular supplies of the Quartermaster's Department.....	564,380 06	13,617 82	.....	550,762 24
Incidental expenses of the Quartermaster's Department.....	218,537 23	8,944 26	.....	209,592 97
Barracks and quarters.....	67,710 93	13,490 00	.....	54,220 93
Transportation of the Army and supplies.....	1,267,503 46	75,747 95	.....	1,191,755 51
Transportation of officers and their baggage.....	112,340 62	572 86	.....	111,767 76
Horses for cavalry and artillery.....	65,980 07	17,806 39	.....	48,173 68
Clothing, camp and garrison equipage.....	257,280 74	16,060 89	.....	241,219 85
Keeping, transporting, and supplying prisoners of war.....	554,844 94	34,479 85	.....	520,365 09
Heating and cooking stoves.....	34,612 64	.....	68 47	34,681 11

Telegraph and military purposes	17, 220 36			17, 220 36
National cemeteries	148, 607 93			34, 681 58
Purchase, construction, and maintenance of steam-rans	399, 609 82			399, 609 82
Gunboats on western rivers	43, 408 28			
Purchase of clocks for permanent posts	522 00			522 00
Barracks and quarters at military posts in Minnesota	2, 872 49			2, 872 49
Ordnance service	10, 867 21			10, 274 76
Ordnance stores and supplies	1, 472, 349 41	7, 296 10		1, 485, 645 51
Armament of fortifications	2, 886 82			2, 886 82
Manufacture of arms at the national armories	49, 096 63			49, 096 63
Purchase of arms for volunteers and regulars	16 76			16 76
Magazine for storing gunpowder	412 76			412 76
Arsenals	2, 331 76	300 00		2, 031 76
San Antonio arsenal	4 43			4 43
Rock Island bridge	570, 309 57			570, 309 57
Forage for artillery and cavalry horses, Military Academy		3, 118 60		3, 118 60
Warming apparatus for academic buildings, Military Academy		3, 235 15		3, 235 15
Gas-pipes, gasometers, and retorts		39 97		39 97
Models for the department of cavalry		305 62		305 62
Furniture for hospital for cadets		50 17		50 17
Supplying horses for artillery and cavalry practice		1, 339 93		1, 339 93
Expenses of the board of visitors		14 34		14 34
Mess-room and kitchen for cadets' hospital		188 79		188 79
Repair, preservation, and extension of river and harbor works	74, 276 41	1, 251 68		75, 528 09
Expenses of recruiting	88, 956 91			88, 956 90
Collecting, drilling, and organizing volunteers	1, 951, 744 53	691 01		1, 951, 468 76
Bounty to volunteers and regulars on enlistment	1, 987, 805 93	275 77		1, 987, 755 93
Draft and substitute fund	184, 214 13	50 00		184, 214 13
Medical and hospital department	1, 200, 858 54			1, 195, 552 38
Medical and surgical history and statistics	59 97	5, 306 16		5, 306 16
Providing for the comfort of sick and discharged soldiers	4, 000 00			
Support of the Bureau of Refugees, Freedmen, and Abandoned Lands	34, 037 06	45 77		3, 954 23
Contingencies of the Army	46, 653 65			34, 037 06
Secret-service fund	24, 678 54	5, 839 93		70, 813 72
Supplying arms and munitions of war to loyal citizens in revolted States	365, 757 84			24, 678 54
Suppressing Indian hostilities in Minnesota	7, 420 19	945 38		364, 212 46
Defraying expenses of minute-men and volunteers in Pennsylvania, Maryland, Ohio, Indiana, and Kentucky	28, 762 32			7, 420 19
Reimbursing Nebraska for expenses in suppressing Indian hostilities in 1864	10, 906 63	28, 762 32		
Refunding California for expenses in suppressing Indian hostilities in 1864	9, 645 52			10, 906 63
Expenses of military convicts	119 88			9, 645 52
Medals of honor		*150 00		119 88
Total, War	33, 743, 461 41	999, 269 79	17, 179 05	33, 761, 520 67
WAR—CIVIL.				
Compensation of Secretary of War, clerks, &c., in his office	1 01	1 01		
Contingent expenses, office of Adjutant-General	4, 000 00	4, 000 00		
Compensation of clerks, &c., office of Quartermaster-General	2, 048 44	2, 048 44		
Rent of building occupied by Paymaster-General, fuel, &c	1, 500 00	1, 500 00		

UNEXPENDED BALANCES OF APPROPRIATIONS.

Appropriations.		Amounts which may be carried to the surplus fund.
WAR—CIVIL—Continued.		
Salaries of employes public buildings and grounds		
Completing Washington Aqueduct		
Total, War-civil		
NAVY.		
Pay of the Navy		
Payments on contracts prior to March 4, 1869		
Contingent, Navy		
Pay of Marine Corps		
Provision, Marine Corps		
Clothing for Marine Corps		
Fuel for Marine Corps		
Military stores for Marine Corps		
Transportation and recruiting, Marine Corps		
Repairs of barracks of Marine Corps		
Marine barracks at Mare Island, California		
Navy-yard at—		
Portsmouth, New Hampshire		
Boston, Massachusetts		
New York, New York		
Philadelphia, Pennsylvania		
Washington, District of Columbia		
Pensacola, Florida		
Mare Island, California		
Naval station at—		
Sackett's Harbor, New York		
Midway Island		
Key West, Florida		
Mound City, Illinois		
Emergencies at naval stations		
Naval asylum at Philadelphia, Pennsylvania		
Civil establishment, Yards and Docks		

Contingent, Yards and Docks	70,870 02	114 36	74,755 66
Equipment of vessels	174,903 89	3,296 68	171,609 21
Civil establishment, Equipment and Recruiting	1,107 13		1,107 13
Contingent, Equipment and Recruiting	80,963 27	59 02	81,022 29
Navigation and navigation supplies	30,971 95	1,511 14	32,483 09
Naval Observatory	8,420 07		8,420 07
Nautical Almanac	762 87	1 34	764 21
Nautical instruments	21,464 18		21,464 18
Civil establishment, Navigation	200 94		200 94
Contingent, Navigation	7,742 28	5 61	7,747 89
Ordnance and ordnance stores			
Magazine at—			
Portsmouth, New Hampshire	22,466 84	28,516 17	
Boston, Massachusetts	11,310 55		11,310 55
New York, New York	1,950 96		1,950 96
Philadelphia, Pennsylvania	22,863 36		22,863 36
Washington, District of Columbia	2,665 36		2,665 36
Pensacola, Florida	275 18		275 18
Civil establishment, Ordnance	3,212 04		3,212 04
Contingent, Ordnance	396 05		396 05
Construction and Repair	15 68	2 94	18 62
Civil establishment, Construction and Repair	400,794 53	126,287 64	274,506 89
Contingent, Construction and Repair	24,440 32		24,440 32
Steam machinery	10 57		10 57
Civil establishment, Steam-Engineering	67 14	8 74	75 88
Contingent, Steam-Engineering	773 34		773 34
Provisions, Navy	132 44		132 44
Civil establishment, Provisions and Clothing	643,548 19	3,447 01	640,101 18
Contingent, Provisions and Clothing	29,235 73		29,235 73
Surgeons' necessaries and appliances	69,525 28	87 12	69,612 40
Hospital at—	56,055 48	4 41	56,059 89
New York	52 25		52 25
Washington, District of Columbia	178 60	1 40	180 00
Pensacola, Florida	25,558 24		25,558 24
Mare Island, California	64 73		64 73
Repairs and improvement of hospitals	3,491 29	1 16	3,492 45
Laboratory at New York	90		90
Civil establishment, Medicine and Surgery	63,111 53		63,111 53
Contingent, Medicine and Surgery	8,778 76	8 04	8,786 80
Total, Navy	3,836,328 34	276,607 57	3,561,462 12
INTERIOR—PENSIONS AND INDIANS.			
Army pensions to invalids	782,022 42	339 11	781,683 31
Army pensions to widows and others	7,995,748 78	6,756 12	8,002,504 90
Army pensions, war of 1812	213,866 76		213,866 76
Navy pensions to invalids	328 63	2,730 15	
Navy pensions to widows and others	76,412 94	316 86	76,096 58
Total, Interior—Pensions and Indians	9,068,379 53	6,756 12	9,074,151 55

B.—Statement of balances of appropriations July 1, 1872, made for the service of the fiscal year ended June 30, 1871, &c.—Continued.

Appropriations.	Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during the quarter ended September 30, 1872.	Amounts which may be carried to the surplus fund.
INTERIOR—CIVIL.				
Payment to William Hardin for surveying public lands in Nebraska.....	\$27 79			\$27 79
Capitol extension			\$645 35	645 35
Dredging the Washington City Canal	10,811 17			10,811 17
Expense of the eighth census	175,551 39	\$408 76		175,142 63
Purchase of the building known as the club-house, at Charleston, South Carolina, and the fitting up thereof for use of the United States courts.....	102 08	102 08		
Erecting penitentiary in Colorado.....	599 91			599 91
Erecting penitentiary in Washington Territory.....	19,291 50			19,291 50
Surveying the public lands in California	23,672 55			23,672 55
Surveying the eastern boundary of California.....	3,066 87			3,066 87
Surveying the public lands in—				
Florida.....	1,284 61			1,284 61
Louisiana	6,970 63	4,977 21		1,993 42
Washington Territory	2,736 30	904 13		1,832 17
Wyoming Territory.....	17,681 37	1,387 94		16,293 43
Expenses of depositing public moneys by receivers of public moneys	88,454 70	1,433 57		87,021 13
Contingent expenses of the several land-offices	7,886 40	1,516 48		6,369 92
Salaries and commissions of registers and receivers	3,702 58	1,743 99		1,958 59
Total, Interior—Civil	361,839 85	12,474 16	645 35	350,011 04

* These items which appear as apparent overdrafts on the appropriations are not such in fact, the amounts represented by each having been repaid to the Treasury, but not carried to the credits of the accounts on the books from which these balances were taken until the following month.

C.—Statement of balances of appropriations July 1, 1872, made specifically for the service of that fiscal year, and limited by the terms of the 5th section of the act of July 12, 1870, to the year for which made, together with a statement of the expenditures of the first quarter of the current year, and the amounts which may be carried to the surplus fund.

Appropriations.		Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during the quarter ended September 30, 1872.	Amounts which may be carried to the surplus fund.
TREASURY.					
Salaries and mileage of Senators.....		\$117,755 39		\$3,239 48	\$120,994 87
Salaries of officers, &c., of Senate.....				108 00	108 00
Contingent expenses of Senate:					
Clerks to committees, pages, &c.....				61 50	61 50
Labor.....				682 00	682 00
Folding documents.....		7,000 00	\$7,000 00		
Miscellaneous items.....		8,000 00			
Capitol police.....					
Salaries and mileage of members and Delegates of House of Representatives.....		344,442 11		5,506 35	13,506 35
Salaries of officers, &c., House of Representatives.....		2,405 00	159,078 02	166 95	166 95
Contingent expenses of House of Representatives:					
Clerks to committees.....					2,405 00
Cartage.....		8,825 04	4,570 80		4,254 24
Fuel.....		2,793 10			2,793 10
Horses and carriages.....					78
Furniture and repairs.....		400 50			400 50
Laborers.....		38 92			38 92
Pages.....		1,245 24			1,245 24
Additional pay to reporters.....		4,506 84			4,506 84
Salaries of Capitol police.....		200 00			200 00
Reporting and publishing debates in Congress.....		16			16
Salaries, Library of Congress.....		159,945 04	68,361 66		91,583 38
Contingent expenses, Library of Congress.....		140 00			140 00
Increase of Library of Congress.....		879 00	879 00		
Improving Botanic Garden.....		48 12	48 12		
Contingent expenses of the Congressional Printer.....		200 17	200 17		
Paper for the public printing.....		1,205 01			1,205 01
Public printing.....		335,616 22	213,964 62		121,651 60
Public binding.....		33,212 60	21,398 01		12,314 59
Lithographing and engraving.....		62,319 60	60,502 61		1,816 99
Salary of the President of the United States.....		55,029 44	10,000 00		45,029 44
		2,083 34	2,083 34		

C.—Statement of balances of appropriations July 1, 1872, made specifically for the service of that fiscal year, &c.—Continued.

Appropriations.				
	Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during the quarter ended September 30, 1872.	Amounts which may be carried to the surplus fund.
TREASURY—Continued.				
Salary of the Vice-President of the United States.....	\$659 34			\$7,820 00
Salaries, Department of State.....	7,820 00			3,000 00
Contingent expenses of Department of State.....	3,000 00			
Salaries, office of—				
Supervising Architect.....	40 00			40 00
First Comptroller.....	4,320 00		\$296 13	4,616 13
Second Comptroller.....	4,800 00		798 03	5,598 03
Commissioner of Customs.....	260 00		680 46	940 46
First Auditor.....			946 05	946 05
Second Auditor.....	6,253 03			6,253 03
Third Auditor.....	6,480 00		1,839 30	8,319 30
Fourth Auditor.....	420 00		751 58	1,171 58
Fifth Auditor.....			1,121 66	1,121 66
Treasurer.....	18,549 30		1,397 07	19,946 37
Additional treasurer.....	1,003 35			1,003 35
Register.....	12,020 00		1,016 52	13,036 52
Comptroller of the Currency.....			211 11	211 11
Commissioner of Internal Revenue.....	19,060 00		1,400 17	20,460 17
Light-House Board.....			04	04
Bureau of Statistics.....	440 00		916 58	1,356 58
Contingent expenses of the Treasury Department.....	12,003 75	8,043 00		3,960 75
Fuel, lights, and miscellaneous items, Treasury Department.....	3,616 71	1,500 00		2,116 71
Furniture and carpets, Treasury Department.....	9,192 62	9,192 62		
Vaults, safes, and locks for public buildings.....	100,000 00	20,000 00		80,000 00
Plans of public buildings.....	5,000 00	5,000 00		
Stationery for Treasury Department.....	98 48			98 48
Salaries, office of Secretary of the Navy.....			5 43	5 43
Salaries, Bureau of Yards and Docks.....	2,942 39		75 00	3,017 39
Salaries, Post-Office Department.....	10,183 25		2,940 47	13,123 72
Deficiency in postal service.....	885,633 60			885,633 00
Telegraphing between Atlantic and Pacific States.....	26,520 55			26,520 55
Salaries, Department of Agriculture.....	462 08	314 97		147 11
Collecting agricultural statistics.....	2,115 50	500 00		1,615 50
Purchase and distribution of valuable seeds.....	2,500 00	2,500 00		

Museum, Department of Agriculture.....	500 00	500 00	.....	500 00
Furniture cases, and repairs, Department of Agriculture.....	514 50	514 50	.....	514 50
Laboratory, Department of Agriculture.....	469 65	469 65	.....	469 65
Experimental garden, Department of Agriculture.....	1,292 04	1,292 04	.....	1,292 04
Contingent expenses, Department of Agriculture.....	1,655 10	1,655 10	.....	1,655 10
Improvement of grounds, Department of Agriculture.....	800 00	800 00	.....	800 00
Salaries, Department of Justice.....	85 72	.....	1,826 80	1,912 52
Contingent expenses of the Department of Justice.....	954 86	940 46	.....	14 40
Contingent expenses of the commissioners to codify the laws.....	7,000 00	3,000 00	.....	4,000 00
Defending claims under convention with Mexico.....	18,380 45	756 50	.....	17,623 95
Prosecution of claims.....	39,951 35	38 31	1,276 10	1,276 10
Defending suits and claims for seizure of captured and abandoned property.....	24,374 18	217 04	.....	39,913 04
Prosecution and collection of claims.....	3,625 60	2,643 19	.....	24,157 14
Support of convicts.....	20,000 00	.....	.....	982 41
Defending claims for cotton seized.....	137,464 57	136,700 00	.....	20,000 00
Expenses of United States courts.....	1,000 00	.....	.....	764 57
Pay of attorneys, witnesses, &c., Court of Claims.....	.....	.....	426 29	1,000 00
Contingent expenses of the Court of Claims.....	302,987 28	203,973 85	.....	99,013 43
Payment of judgments.....	286 90	286 90	.....	.....
Salaries of district judges.....	451 97	236 92	.....	215 05
Salaries of district marshals.....	170 30	166 48	.....	3 82
Salaries of governor, judges, &c., of Territory of Arizona.....	686 81	686 81	.....	.....
Contingent expenses of Territory of Arizona.....	500 00	500 00	.....	.....
Salaries of governor, judges, &c., of Territory of Dakota.....	212 63	.....	.....	212 63
Legislative expenses of Territory of Dakota.....	6,000 00	4,302 40	.....	1,697 60
Salaries of governor, judges, &c., of Territory of Idaho.....	124 99	.....	.....	124 99
Contingent expenses of Territory of Idaho.....	337 50	.....	.....	337 50
Legislative expenses of Territory of Montana.....	3,564 00	160 00	.....	3,404 00
Salaries of governor, judges, &c., of Territory of New Mexico.....	257 53	.....	.....	257 53
Legislative expenses of Territory of New Mexico.....	1,231 26	512 61	.....	718 65
Salaries of governor, judges, &c., of Territory of Washington.....	1,260 99	1,260 99	.....	.....
Contingent expenses of Territory of Washington.....	500 00	428 96	.....	71 04
Salaries of governor, judges, &c., of Territory of Wyoming.....	637 40	.....	.....	637 40
Legislative expenses of Territory of Wyoming.....	4,200 00	.....	.....	4,200 00
Salaries, government of the District of Columbia.....	6,277 00	2,261 00	.....	4,016 00
Salaries, office of assistant treasurer at—	.....	.....	.....	.....
Baltimore.....	15 21	.....	.....	15 21
Boston.....	53 93	.....	.....	53 93
Charleston.....	.....	.....	78 25	78 25
New York.....	777 72	.....	.....	777 72
Philadelphia.....	3 00	.....	878 78	881 78
San Francisco.....	.....	.....	598 35	598 35
Rent of office of assistant treasurer at Saint Louis.....	2,500 00	.....	.....	2,500 00
Salaries of additional clerks of independent treasury.....	10,000 00	.....	.....	10,000 00
Contingent expenses of independent treasury.....	65,327 72	7,432 77	.....	57,894 95
Expenses of national currency.....	2,346 28	.....	.....	2,346 28
Suppressing counterfeiting and fraud.....	971 30	634 35	.....	336 95
Wages of workmen of branch mint at Carson City.....	6,000 00	6,000 00	.....	.....
Contingent expenses of branch mint at Carson City.....	12,400 00	12,400 00	.....	.....
Salaries, branch mint at Charlotte, North Carolina.....	375 00	375 00	.....	.....
Wages of workmen of branch mint at Charlotte, North Carolina.....	172 00	120 00	.....	52 00

C.—Statement of balances of appropriations July 1, 1872, made specifically for the service of that fiscal year, &c.—Continued.

Appropriations.				
	Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during the quarter ended September 30, 1872.	Amounts which may be carried to the surplus fund.
TREASURY—Continued.				
Contingent expenses of branch mint at Charlotte, North Carolina	\$467 50			\$467 50
Salaries, branch mint at Denver, Colorado	1,600 00			1,600 00
Contingent expenses of branch mint at San Francisco			\$825 70	825 70
Salaries, assay office at Boise City, Idaho	2,100 00			2,100 00
Wages of workmen of assay office at Boise City, Idaho	500 00			500 00
Salaries, assay office at New York			3,500 00	3,500 00
Wages of workmen of assay office at New York			808 64	808 64
Contingent expenses of assay office at New York			1,079 65	1,079 65
Vessels for Coast Survey	17,000 00	\$17,000 00		
Promoting the efficiency of the civil service	1,700 00	79 60		1,620 40
Compensation and contingent expenses of commissioners in insurrectionary districts	37,654 80			37,654 80
Checks and certificates of deposit	4,540 40	425 00		4,115 40
Revenue-cutter service	150,587 82	12,039 84		138,547 98
Supplies of light-houses	4,916 51	4,419 82		496 69
Repairs and incidental expenses of light-houses	2,843 51	1,546 48		1,297 03
Salaries of keepers of light-houses	2,968 35	2,581 55		386 80
Expenses of light-vessels	9,080 38	8,260 42		819 96
Expenses of buoyage	3,620 39	1,977 73		1,642 66
Repairs and preservation of public buildings	28,848 69		14,171 14	43,019 83
Furniture for public buildings	950 15	950 15		
Fuel, lights, and water for public buildings	50,199 79	8,409 85		41,789 94
Pay of custodians and janitors	150,000 00			150,000 00
Marine Hospital Establishment	107,237 93	29,438 04		77,799 89
Appraisers' stores, Philadelphia	4,877 90	1,958 43		2,919 47
Marine hospital, Chicago	38,657 50	19,539 70		19,117 80
Defending suits respecting captured and abandoned property	30,000 00	18,050 00		11,950 00
Preserving life and property from shipwrecked vessels	177,511 98	3,316 66		174,195 32
Preserving life and property from shipwrecked vessels, Narragansett Beach	6,868 35	5,435 78		1,432 57
Preserving life and property from shipwrecked vessels, contingent expenses	5,453 50	5,262 49		191 01
Construction of revenue-cutters	196,980 21	9,381 16		187,599 05
Whales' Back light-station, New Hampshire	1,950 00			1,950 00
Juniper Island light-station, Vermont			38 10	38 10
Penfield Reef light-station, Long Island, Connecticut	19,868 04	36 00		19,832 04
Split Rock light-station, New York			11 55	11 55

Presque Isle light-station, Pennsylvania	9,000 00	9,000 00	49	7,691 22	49
Danverskie Island light-station, Georgia	8,691 22	1,000 00		9,900 84	
Alligator's Reef light-station, Florida	9,893 84			7 00	
Florida Reef beacons, Florida	7,447 60	4,993 00			
Mobile Point light-station, Alabama	11,574 82	7,641 58			
Sand Island light-station, Alabama	9,454 07				
Point aux Herbes light-station, Louisiana	9,455 96			4,339 33	
Trinity Shoals light-station, Louisiana	14,982 00	7,439 50		5,294 91	
Calcasieu light-station, Louisiana	22,986 00	22,986 00			
Timbalier light-station, Louisiana				10 57	
Cleveland light-station, Ohio				50	
Vermillion light-station, Ohio					
Grand River light-station, Ohio	30,000 00	150 10		29,849 90	
Chicago light-station, Illinois	30,602 09	20,834 75		9,767 34	
Spectacle Reef light-station, Michigan	4,000 00			4,000 00	
Eagle River light-station, Michigan	8,000 00	1,000 00		7,000 00	
Saint Clair Flats light-station, Michigan	10,000 00	9,000 00		1,000 00	
Manistee light-station, Michigan	3,358 14			5,798 74	
Pier-head beacon-lights on the lakes	4,509 10	3,029 60		1,479 50	
Du Luth light-station, Minnesota	6,732 37			6,732 37	
San Pablo Straits light-station, California	2 17			2 17	
Pigeon Point light-station, California				13 92	
Point Arena light-station, California	23,628 56			23,628 56	
Cape Foulweather light station, Oregon	3,506 65	3,506 65			
Custom-house at Machias, Maine				23 72	
Marine hospital, Detroit, Michigan	3,000 00			3,000 00	
Absecom light-station, New Jersey	6,450 96			6,450 96	
Calumet light-station, Illinois					
Custom-house at—					
Astoria, Oregon	26,128 90	15,000 00		11,128 90	
Cairo, Illinois				1,023 60	
Knoxville, Tennessee	30,208 72	29,808 72			
Portland, Oregon	85,782 06	48,697 81		37,084 25	
Saint Paul, Minnesota	15,911 50	8,988 16		6,923 34	
New Orleans, Louisiana	265,000 00	107,113 00		157,887 00	
Portland, Maine	4,851 00	2,200 00		2,651 00	
Chicago, Illinois	1,997,547 47	1,253,164 43		744,383 04	
Newport, Rhode Island	8,141 75	6,800 00		1,341 75	
Charleston, South Carolina	90,000 00	18,813 00		71,187 00	
Assessing and collecting internal revenue, 1872	329,430 28	151,520 15		177,910 13	
Punishment for violation of internal-revenue laws, 1872	79,473 97	9,807 01		69,666 96	
Stamps, paper, and dies, 1872	121,298 18	50,067 85		71,230 33	
Salaries of ministers	88,725 19	54,552 75		34,172 44	
Salaries of secretaries of legation	4,333 33	523 62		3,809 71	
Contingent expenses of foreign missions	41,595 50	21,649 94		19,945 56	
Salaries of interpreters to mission to Japan	932 95	206 04		726 91	
Salaries of interpreters to consulates in China, Japan, Siam, and Turkey	1,219 95	1,147 27		72 68	
Salaries of marshals for consular courts	3,188 70	880 33		2,308 37	
Salaries of consuls	156,887 49	112,571 87		44,315 62	
Contingent expenses of United States consulates	7,178 14	6,851 10		327 04	
Salaries of United States and Mexican Claims Commission	2,502 34			2,502 34	
Salaries and expenses of commission between the United States and Spain	2,352 65			5 21	

C.—Statement of balances of appropriations July 1, 1872, made specifically for the service of that fiscal year, &c.—Continued.

Appropriations.	Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during the quarter ended September 30, 1872.	Amounts which may be carried to the surplus fund.
TREASURY—Continued.				
Expenses for interpreters, guards, &c., in Turkish Dominions.....	\$1,053 10	\$651 25	.....	\$401 85
Prisons for American convicts.....	15,682 68	2,655 23	.....	13,027 45
Bringing home criminals.....	3,415 33	.....	.....	3,415 33
Relief and protection of American seamen.....	4,536 27	.....	\$20,409 67	33,945 94
Expenses under the neutrality act.....	20,000 00	.....	.....	20,000 00
Diplomatic and consular war-expenses in Madrid, Paris, Berlin, and London.....	13,113 04	804 38	.....	12,308 66
Salaries and expenses of the commission between the United States and Great Britain.....	10,731 87	2,872 85	.....	7,859 02
Tribunal of Arbitration at Geneva.....	132,433 41	75,000 00	.....	57,433 41
Expenses of the embassy from Japan.....	25,000 00	750 00	.....	24,250 00
Improvement and care of protestant cemetery at Malaga, Spain.....	500 00	.....	.....	500 00
Annual expenses of Cape Spartel light, coast of Morocco.....	285 00	.....	.....	285 00
Consular building at Tangier.....	3,000 00	.....	.....	3,000 00
Improvement and care of the protestant cemetery in the city of Mexico.....	1,105 00	730 25	.....	374 75
Inquiries into depredations on the Texan frontier.....	5,190 00	3,298 17	.....	1,891 83
Total, Treasury.....	7,877,606 52	3,216,344 40	92,243 54	4,753,495 66
WAR.				
Pay of the Army.....	630,392 38	103,792 79	.....	526,599 59
Pay of Military Academy.....	47,775 50	.....	.....	47,775 50
Mileage.....	625 50	.....	278 10	898 60
General expenses.....	90 39	44 39	.....	46 00
Subsistence of the Army.....	272,482 76	.....	210,729 66	483,212 42
Regular supplies of the Quartermaster's Department.....	21,021 25	18,466 15	.....	2,555 10
Incidental expenses of the Quartermaster's Department.....	57 15	.....	91 35	148 50
Barracks and quarters.....	27,774 90	4,150 91	.....	23,623 99
Transportation of the Army and supplies.....	52,070 10	51,947 61	.....	122 49
Horses for cavalry and artillery.....	1,559 00	719 54	.....	839 46
Clothing, camp and garrison equipage.....	12,576 97	12,544 42	.....	32 55
Heating and cooking stoves.....	5 00	.....	11 50	16 50
National cemeteries.....	17,332 89	.....	7,132 76	24,465 65
Ordnance stores and supplies.....	.....	.....	12,815 90	12,815 90

Washington arsenal.....	92 05			92 05
Columbus arsenal.....	209 74			209 74
Bridge-trains and equipage.....	46 55			46 55
Miscellaneous items and incidental expenses, Military Academy.....	2,500 00			2,500 00
Expenses of recruiting.....	6,633 93			6,633 93
Contingent expenses of the Adjutant-General's Department.....	1,275 00		20 00	1,295 00
Medical and Hospital Department.....	986 22		264 72	1,250 94
Contingencies of the Army.....	41,960 55		197 15	42,157 70
Refunding to States expenses incurred in raising volunteers.....	703,854 39		3,550 28	707,404 67
Expenses of military convicts.....	19,522 53		18,082 14	37,604 67
Transportation of insane volunteer soldiers.....	1,000 00			1,000 00
Claims of loyal citizens for supplies furnished during the rebellion.....	153,078 53		141,111 77	294,190 30
Bureau of Refugees, Freedmen, and Abandoned Lands.....				
Expenses of arbitration between the United States and the Green Bay and Mississippi Canal Company *.....			11 17	11 17
Total, War.....	2,014,923 28	361,585 84	231,085 44	1,891,136 85

WAR--CIVIL.

Salaries, office of the Secretary of War.....	1,194 98			1,195 99
Contingent expenses of office of the Secretary of War.....			1 01	1 01
Salaries, office of the Adjutant-General.....			4 12	4 12
Contingent expenses of office of the Adjutant-General.....	4,000 00		2 21	4,002 21
Salaries, office of the Quartermaster-General.....	2,828 91		860 80	3,689 71
Contingent expenses of office of the Quartermaster-General.....				
Salaries, office of the Commissary-General.....	81 53		62	143 53
Contingent expenses of office of the Commissary-General.....				
Contingent expenses of office of the Surgeon-General.....			5 26	5 26
Salaries, office of the Paymaster-General.....	184 97		5 75	190 72
Contingent expenses of office of the Paymaster-General.....			200 00	200 00
Salaries, office of the Chief Engineer.....			22 87	22 87
Contingent expenses of office of the Chief Engineer.....			145 05	145 05
Salaries, office of the Chief of Ordnance.....	13 05		12	25 05
Contingent expenses of office of the Chief of Ordnance.....			102 20	115 25
Salaries of superintendent, &c., of the War Department building.....	7 25		1 74	8 99
Contingent expenses of the War Department building.....			77 14	84 39
Contingent expenses of building corner of Fifteenth and F streets.....	1,500 00		8 96	1,508 96
Support and treatment of transient paupers.....	1,000 00		2,146 73	3,146 73
Total, War--Civil.....	10,810 69	1,000 00	3,584 58	13,395 27

NAVY.

Pay of the Navy.....	136,866 23	80,341 98		217,208 21
Naval Academy.....	9,482 25			9,482 25
Contingent expenses of the Navy.....	36,120 18	4,758 83		40,879 01
Pay of the Marine Corps.....	293,456 54		251 83	293,708 37
Provisions, Marine Corps.....	27,000 00			27,000 00
Transportation and recruiting, Marine Corps.....	500 00			500 00
Purchase of Gatling guns and ammunition.....	10,539 00	505 00		11,044 00

C.—Statement of balances of appropriations July 1, 1872, made specifically for the service of that fiscal year, &c.—Continued.

Appropriations.				
	Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during the quarter ended September 30, 1872.	Amounts which may be carried to the surplus fund.
NAVY—Continued.				
Navv-yard at—				
Portsmouth, New Hampshire	\$375 67			\$428 44
Boston, Massachusetts			\$52 77	449 64
New York, New York	3,194 93	\$2,394 13		800 80
Philadelphia, Pennsylvania *	5,724 54	*6,692 24		
Washington, District of Columbia	3,076 41	2,274 59		801 82
Norfolk, Virginia	204 55		95 81	300 36
Pensacola, Florida	88 70	58 87		29 83
Mare Island, California	305 24		11,584 36	11,889 60
Naval station at—				
Sackett's Harbor	454 00	437 05		16 95
League Island	78,212 00	52,520 00		25,692 00
Key West, Florida	13,081 79	168 00		12,913 79
New London, Connecticut	3,523 49	1,135 00		2,388 49
Mound City	92 00			92 00
Emergencies at naval stations	7,215 58	7,171 00		44 58
Naval asylum at Philadelphia, Pennsylvania	33,263 00	10,136 52		23,126 48
Protecting timber-lands	2,139 00	2,139 00		
Civil establishment, yards and docks	4,057 00		225 90	4,282 90
Contingent, yards and docks	72,159 81	56,469 61		15,690 20
Equipment of vessels	83,087 73	74,922 32		8,165 41
Civil establishment, equipment and recruiting			23 03	23 03
Contingent, equipment and recruiting	52,331 06	8,310 17		44,020 89
Navigation and navigation supplies	42,995 05	16,893 46		26,101 59
Naval Observatory	188 00	16 20		171 80
Purchase of a refracting telescope	10,000 00	5,000 00		5,000 00
Nautical Almanac	2,237 00	1,691 59		545 41
Civil establishment, navigation	1,352 00		137 01	1,489 01
Contingent, navigation	2,941 00	1,062 30		1,878 70
Ordnance and ordnance stores	122,662 97	62,951 28		59,711 69
Torpedo-boats	440,879 00	126,566 17		314,312 83
Civil establishment, ordnance	1,123 00	5 58		1,117 42
Contingent, ordnance	343 20	281 47		61 73
Construction and repairs	1,576 51	844 26		732 25
Civil establishment, construction and repairs	940 00		311 54	1,251 54

Steam-machinery	108,432 45	97,331 72	.....	11,100 73
Civil establishment, steam engineering	2,556 00	.....	361 67	2,917 67
Provisions, Navy	345,037 54	14,206 62	.....	330,830 92
Civil establishment, provisions and clothing	3,114 00	.....	65 19	3,179 19
Contingent, provisions and clothing	30,171 31	11,992 14	.....	18,179 17
Surgeons' necessaries and appliances	24,841 39	14,475 16	.....	10,366 23
Repairs and improvements of hospitals	4,502 70	2,297 00	.....	2,205 70
Civil establishment, medicine and surgery	8,053 00	.....	131 91	8,184 91
Contingent, medicine and surgery	3,131 35	3,284 06	.....	.....
Total, Navy	2,033,628 17	669,333 32	13,690 66	1,379,105 92

INTERIOR—PENSIONS AND INDIANS.

Collecting and subsisting Apaches of Arizona and New Mexico	72,922 17	20,727 97	.....	51,494 20
Subsistence and civilization of the Arickarees, Gros Ventres, and Mandans of Fort Berthold agency, Dakota ..	14,411 17	5,478 08	.....	8,933 09
Subsistence of Indians at Milk River agency, Montana	37,735 08	21,166 00	.....	16,569 08
Subsistence of the Navajo Indians in New Mexico	52,477 45	9,752 50	.....	42,724 95
Army pensions to invalids	48,919 45	45 00	.....	48,874 45
Army pensions to widows and others	765,722 17	6,467 42	.....	759,254 75
Army pensions of war of 1812	1,385,320 98	.....	.....	1,385,320 98
Navy pensions to invalids	1,152 34	.....	3,640 20	4,792 54
Navy pensions to widows and others	23,320 00	.....	212 01	23,532 01
Total, Interior proper	2,401,280 81	63,636 97	3,852 21	2,341,496 05

INTERIOR—CIVIL.

Fuel, lights, &c., Department of the Interior	2 00	.....	.....	2 00
Maryland Institution for the Blind .....	.....	300 00	.....	.....
Current expenses, Government Hospital for the Insane	35,000 00	35,000 00	.....	.....
Inclosing grounds Government Hospital for the Insane	3,000 00	3,000 00	.....	.....
Smithsonian Institution building	5,000 00	.....	.....	5,000 00
Annual repairs of the Capitol	37	.....	.....	37
Grading Capitol grounds	25,000 00	.....	.....	25,000 00
Repairs of rooms in State-house of Mississippi occupied by register and receiver	600 00	.....	.....	600 00
Erection of penitentiary, Territory of Wyoming	17,854 08	16,375 00	.....	1,479 08
Penitentiary building, Territory of Idaho	240 15	240 15	.....	.....
Salaries and commissions of registers and receivers	59,150 06	1,359 07	.....	57,790 99
Contingent expenses of land-offices	6,677 67	1,743 34	.....	4,934 33
Expenses of depositing public moneys	3,926 49	245 49	.....	3,681 00
Salaries, office of surveyor-general of Arizona	1,406 47	1,406 47	.....	.....
Contingent expenses, office of surveyor-general of Arizona	1,969 81	201 25	.....	1,768 56
Salaries, office of surveyor-general of California	1,664 13	1,664 13	.....	.....
Contingent expenses, office of surveyor-general of California	2,100 04	1,615 43	.....	484 61
Salaries, office of surveyor-general of Colorado	1,150 01	1,150 01	.....	.....
Contingent expenses, office of surveyor-general of Colorado	833 21	692 02	.....	141 19
Salaries, office of surveyor-general of Dakota	2,369 58	1,500 00	.....	869 58
Contingent expenses, office of surveyor-general of Dakota	900 21	367 97	.....	532 24
Salaries, office of surveyor-general of Florida	1,282 97	1,163 18	.....	119 79
Contingent expenses, office of surveyor-general of Florida	847 12	236 75	.....	610 37
Salaries, office of surveyor-general of Idaho	1,996 45	1,575 00	.....	421 45

—Statement of balances of appropriations July 1, 1872, made specifically for the service of that fiscal year, &c.—Continued.

Appropriations.		Balances unexpended June 30, 1872.	Net expenditures dur- ing quarter ended September 30, 1872.	Excess of repayments during the quarter ended September 30, 1872.	Amounts which may be carried to the surplus fund.
INTERIOR—CIVIL—Continued.					
Contingent expenses, office of surveyor-general of Idaho		\$893 35	\$490 29		\$403 06
Salaries, office of surveyor-general of Kansas		1,399 16	1,399 16		
Contingent expenses, office of surveyor-general of Kansas		671 89	561 78		110 11
Salaries, office of surveyor-general of Louisiana		2,025 00	2,025 00		
Contingent expenses, office of surveyor-general of Louisiana		226 95	226 95		
Salaries, office of surveyor-general of Minnesota		4,396 20	4,232 54		163 66
Contingent expenses, office of surveyor-general of Minnesota		732 82	604 75		128 07
Salaries, office of surveyor-general of Montana		1,572 71	1,565 10		7 61
Contingent expenses, office of surveyor-general of Montana		540 35	511 90		28 45
Salaries, office of surveyor-general of Nebraska and Iowa		1,589 32	1,589 32		
Contingent expenses, office of surveyor-general of Nebraska and Iowa		877 07	780 06		
Salaries, office of surveyor-general of Nevada		1,820 91	1,818 13		27 01
Contingent expenses, office of surveyor-general of Nevada		1,964 57	891 85		2 78
Salaries, office of surveyor-general of New Mexico		2,038 47	1,072 79		1,072 72
Contingent expenses, office of surveyor-general of New Mexico		855 89	453 13		965 68
Salaries, office of surveyor-general of Oregon		1,378 29	1,375 00		402 76
Contingent expenses, office of surveyor-general of Oregon		905 09	515 86		3 29
Salaries, office of surveyor-general of Utah		1,578 81	1,575 00		389 23
Contingent expenses, office of surveyor-general of Utah		964 85	495 95		3 81
Salaries, office of surveyor-general of Washington Territory		1,250 00	1,250 00		468 90
Contingent expenses, office of surveyor-general of Washington Territory		523 07	461 86		
Salaries, office of surveyor-general of Wyoming		1,925 00	1,925 00		61 21
Contingent expenses, office of surveyor-general of Wyoming		1,524 48	844 44		
Surveying public lands in—					680 04
Arizona		1,369 00			1,369 00
California		30,342 16	9,934 08		20,408 08
Colorado		2,273 44	1,199 11		1,074 33
Dakota		1,552 58			1,552 58
Florida		12,500 00	10,211 79		2,288 21
Idaho		75 20			75 20
Louisiana		8,620 91	3,942 46		4,678 45
Minnesota		5,179 56	791 66		4,387 90
Nevada		9,523 43	9,431 37		92 06
New Mexico		1,910 95			1,910 95

Oregon.....	16,839 95	9,112 34	.....	7,727 61
Surveying of reservation in Oregon*	20,000 00	5,547 80	.....	14,452 20
Surveying public lands in—				
Utah.....	86 35	.....	.....	86 35
Washington Territory ..	8,582 72	5,813 74	.....	2,768 98
Wyoming Territory.....	9,059 44	600 94	.....	8,458 50
Colorado land-grant to Kansas Pacific Railroad Company ..	4,328 74	4,213 91	.....	114 83
Total—Interior, Civil	336,869 50	157,300 32	.....	199,869 18

* These items, which appear as apparent overdrafts on the appropriations, are not such in fact, the amounts represented by each having been repaid to the Treasury, but not carried to the credit of the accounts on the books from which these balances were taken until the following month.

UNEXPENDED BALANCES OF APPROPRIATIONS.

D.—Statement of appropriations for the service of the fiscal year ending June 30, 1873, contained in the annual appropriation acts, and made specifically for the service of the fiscal year, which by the terms of section 5 of the act of July 12, 1870, (16 Stat., 251,) are limited by law to fiscal years; together with a statement of the expenditures for the first quarter of the fiscal year, and the amounts available for the service of the remaining three quarters of the year.

Appropriations.			
	Appropriated for fiscal year ending June 30, 1873.	Expended during first quarter fiscal year.	Available for remaining three quarters fiscal year.
TREASURY.			
Salaries and mileage of Senators.....	\$400,000 00	\$100,000 00	\$300,000 00
Salaries of officers, &c., of the Senate.....	120,228 80	30,057 20	90,171 60
Salaries of temporary clerks of the Senate.....	10,000 00	2,494 68	7,505 32
Contingent expenses of the Senate—			
Stationery, newspapers.....	9,250 00	.....	9,250 00
Stationery, &c., committees, &c.....	5,000 00	.....	5,000 00
Clerks to committees, pages, &c.....	40,000 00	5,000 00	35,000 00
Fuel for heating-apparatus.....	8,000 00	8,000 00	.....
Furniture and repairs.....	5,000 00	3,000 00	2,000 00
Labor.....	21,000 00	5,000 00	16,000 00
Folding documents.....	16,000 00	5,000 00	11,000 00
Packing-boxes.....	740 00	740 00	.....
Miscellaneous items.....	30,000 00	8,000 00	22,000 00
Additional pay to reporters.....	4,000 00	.....	4,000 00
Salaries of Capitol police.....	29,128 00	.....	29,128 00
Salaries and mileage of members and Delegates of the House of Representatives.....	1,000,000 00	208,080 88	791,919 12
Salaries of officers, &c., of the House of Representatives.....	153,422 00	39,418 77	114,003 23
Contingent expenses of the House of Representatives—			
Clerks to committees, &c.....	33,100 00	8,000 00	25,100 00
Cartage.....	6,800 00	.....	6,800 00
Fuel.....	8,000 00	.....	8,000 00
Horses and carriages.....	10,000 00	.....	10,000 00
Furniture and repairs.....	10,400 00	.....	10,400 00
Packing-boxes.....	2,600 00	.....	2,600 00
Laborers.....	13,614 00	.....	13,614 00
Newspapers and stationery.....	31,250 00	.....	31,250 00
Stationery to committees.....	5,000 00	.....	5,000 00
Pages.....	14,944 00	.....	14,944 00
Additional pay to reporters.....	4,800 00	.....	4,800 00
Miscellaneous items.....	60,000 00	5,515 27	54,484 73
Capitol police.....	29,128 00	14,299 65	14,828 35
Folding documents.....	100,000 00	38,795 19	61,204 81
Messengers.....	2,628 00	.....	2,628 00
Salaries, Library of Congress.....	26,140 00	6,500 00	19,640 00
Works of art for the Capitol.....	15,000 00	.....	15,000 00

Increase of Library of Congress	27,000 00		27,000 00
Contingent expenses of Library of Congress	2,000 00	1,000 00	1,000 00
Salaries, Botanic Garden	12,146 00	5,000 00	7,146 00
Improving Botanic Garden	13,000 00	10,500 00	2,500 00
Improving buildings, Botanic Garden	17,500 00	4,500 00	13,000 00
Salaries, &c., office of the Congressional Printer	12,514 00	3,131 20	9,382 80
Contingent expenses of office of the Congressional Printer	2,500 00		2,500 00
Paper for the public printing	709,128 00		709,128 00
Public printing	655,466 36	145,000 00	510,466 36
Public binding	552,435 58	90,000 00	462,435 58
Lithographing and engraving	35,000 00		35,000 00
Payments of judgments rendered by the Court of Claims	400,000 00		400,000 00
Salary of the President	25,000 00		25,000 00
Salary of the Vice-President	8,000 00	4,166 66	20,833 34
Salaries, Executive Office	15,300 00	1,347 82	6,652 18
Contingent expenses of the Executive Office	4,000 00	7,650 00	7,650 00
Salaries, Department of State	78,520 00	2,500 00	1,500 00
Publishing laws, Department of State	62,000 00	20,000 00	58,520 00
Proof-reading, Department of State	3,000 00	37,000 00	25,000 00
Stationery, furniture, &c., for the Department of State	5,000 00	3,000 00	
Books and maps for the Department of State	2,500 00		5,000 00
Contingent expenses of the Department of State	32,500 00	5,000 00	27,500 00
Salaries, office of—			
Secretary of the Treasury	384,120 00	97,000 00	287,120 00
Supervising Architect	28,240 00	6,700 00	21,540 00
First Comptroller	77,320 00	18,500 00	58,820 00
Second Comptroller	137,800 00	34,000 00	103,800 00
Commissioner of Customs	40,760 00	9,500 00	31,260 00
First Auditor	58,280 00	15,000 00	43,280 00
Second Auditor	384,480 00	97,000 00	287,480 00
Third Auditor	289,480 00	75,000 00	214,480 00
Fourth Auditor	82,820 00	21,000 00	61,820 00
Fifth Auditor	59,900 00	14,500 00	45,400 00
Auditor of the Treasury for the Post-Office Department	266,660 00	70,000 00	196,660 00
Treasurer of the United States	197,980 00	45,125 00	152,855 00
Register	85,520 00	18,500 00	67,020 00
Comptroller of the Currency	117,380 00	28,000 00	89,380 00
Commissioner of Internal Revenue	363,740 00	91,900 00	272,740 00
Light-House Board	13,860 00	3,500 00	10,360 00
Bureau of Statistics	65,440 00	16,000 00	49,440 00
Temporary clerks	40,000 00	7,000 00	33,000 00
Contingent expenses of the Treasury Department	65,000 00	12,229 62	52,770 38
Fuel, lights, and miscellaneous items for the Treasury Department	50,000 00	7,000 00	43,000 00
Furniture and carpets for the Treasury Department	25,000 00	4,997 40	20,002 60
Vaults, safes, locks, &c., for public buildings	100,000 00	15,000 00	85,000 00
Plans of public buildings	5,000 00	5,000 00	
Stationery for the Treasury Department*	50,000 00	65,440 29	
Salaries, office of the Secretary of the Navy	35,620 00	9,100 00	26,520 00
Salaries, office of Bureau of—			
Yards and Docks	15,760 00	3,193 00	12,567 00
Equipment and Recruiting	11,960 00	2,997 00	8,963 00
Navigation	6,360 00	1,590 00	4,770 00

D.—Statement of appropriations for the service of the fiscal year ending June 30, 1873, &c.—Continued.

Appropriations.	Appropriated for fiscal year ending June 30, 1873.	Expended during first quarter fiscal year.	Available for re-maintaining three quarters fiscal year.
TREASURY—Continued.			
Salaries, office of Bureau of—			
Ordnance.....	\$9,560 00	\$2,397 00	\$7,163 00
Construction and Repair.....	12,960 00	3,244 00	9,716 00
Steam-Engineering.....	7,760 00	1,947 00	5,813 00
Provisions and Clothing.....	14,760 00	3,730 00	11,030 00
Medicine and Surgery.....	4,960 00	1,241 00	3,719 00
Salaries, office of the Superintendent of the Navy Department building.....	5,290 00	1,322 50	3,967 50
Contingent expenses of the office of the Secretary of the Navy.....	5,000 00	1,500 00	3,500 00
Contingent expenses of Bureau of—			
Yards and Docks.....	800 00	150 00	650 00
Equipment and Recruiting.....	750 00	150 00	600 00
Navigation.....	800 00	150 00	650 00
Ordnance.....	800 00	150 00	650 00
Construction and Repair.....	800 00	150 00	650 00
Steam-Engineering.....	800 00	100 00	700 00
Provisions and Clothing.....	800 00	150 00	650 00
Medicine and Surgery.....	400 00	100 00	300 00
Contingent expenses of the Navy Department building.....	7,000 00	3,000 00	4,000 00
Salaries, Post-Office Department.....	402,940 00	103,000 00	299,940 00
Contingent expenses of the Post-Office Department.....	54,542 00	18,000 00	36,542 00
Deficiency in the postal service.....	5,700,970 00	.....	5,700,970 00
Steamship service between San Francisco, Japan, and China.....	500,000 00	.....	500,000 00
Steamship service between the United States and Brazil.....	150,000 00	.....	150,000 00
Steamship service between the United States and the Sandwich Islands.....	75,000 00	.....	75,000 00
Salaries, Department of Agriculture.....	75,890 00	19,000 00	56,890 00
Collecting agricultural statistics.....	15,000 00	3,000 00	12,000 00
Purchase and distribution of valuable seeds.....	55,000 00	7,500 00	47,500 00
Museum of the Department of Agriculture.....	5,000 00	500 00	4,500 00
Furniture, cases, and repairs for the Department of Agriculture.....	5,200 00	1,000 00	4,200 00
Library of the Department of Agriculture.....	1,750 00	500 00	1,250 00
Laboratory of the Department of Agriculture.....	700 00	.....	700 00
Experimental garden of the Department of Agriculture.....	10,000 00	2,000 00	8,000 00
Contingent expenses of the Department of Agriculture.....	12,900 00	2,000 00	10,900 00
Improvement of grounds of the Department of Agriculture.....	21,000 00	7,000 00	14,000 00
Salaries, Department of Justice.....	95,580 00	26,000 00	69,580 00
Rent of building, Department of Justice.....	15,000 00	3,750 00	11,250 00
Contingent expenses of the Department of Justice.....	21,000 00	7,354 17	13,645 83
Salary of warden of the jail.....	2,000 00	500 00	1,500 00

Salaries of commissioners to codify the laws	15,000 00	3,750 00	11,250 00
Contingent expenses of commissioners to codify the laws	3,000 00	2,000 00	1,000 00
Defending claims under convention with Mexico	10,000 00	375 00	9,625 00
Prosecution of crimes	50,000 00	26,000 00	24,000 00
Defending suits and claims for seizure of captured and abandoned property	30,000 00	5,642 90	24,357 10
Prosecution and collection of claims	25,000 00	300 00	24,700 00
Current expenses of the Reform School, District of Columbia	10,000 00	10,000 00	
Support of convicts	10,000 00		10,000 00
Expenses of United States courts	3,000,000 00	710,602 10	2,289,397 90
Salaries of the judges, &c., of the Court of Claims	29,840 00	6,835 00	23,005 00
Reporting decisions of the Court of Claims	1,000 00	1,000 00	
Contingent expenses of the Court of Claims	3,000 00	1,000 00	2,000 00
Salaries of—			
Justices, &c., of the Supreme Court	78,500 00	21,500 00	57,000 00
Circuit judges	54,000 00	13,500 00	40,500 00
District judges	189,500 00	46,625 00	142,875 00
District attorneys	19,150 00	4,657 60	14,492 40
District marshals	11,700 00	2,875 00	8,825 00
Justices and judges of the supreme court of the District of Columbia	20,500 00	5,125 00	15,375 00
Governor, judges, &c., of the Territory of Arizona	14,000 00	1,500 00	12,500 00
Legislative expenses of the Territory of Arizona	20,000 00		20,000 00
Contingent expenses of the Territory of Arizona	1,000 00		1,000 00
Salaries of the governor, judges, &c., of the Territory of Colorado	13,300 00	339 78	12,960 22
Legislative expenses of the Territory of Colorado	2,000 00	1,500 00	500 00
Contingent expenses of the Territory of Colorado	1,000 00	500 00	500 00
Salaries of the governor, judges, &c., of the Territory of Dakota	13,300 00	1,825 00	11,475 00
Legislative expenses of the Territory of Dakota	20,000 00	2,000 00	18,000 00
Contingent expenses of the Territory of Dakota	1,000 00	500 00	500 00
Salaries of the governor, judges, &c., of the Territory of Idaho	13,500 00	500 00	13,000 00
Legislative expenses of the Territory of Idaho	20,000 00	20,000 00	
Contingent expenses of the Territory of Idaho	1,000 00	500 00	500 00
Salaries of the governor, judges, &c., of the Territory of Montana	13,500 00	625 00	12,875 00
Legislative expenses of the Territory of Montana	2,000 00	2,000 00	
Contingent expenses of the Territory of Montana	1,000 00	500 00	500 00
Salaries of the governor, judges, &c., of the Territory of New Mexico	14,000 00	1,750 00	12,250 00
Contingent expenses of the Territory of New Mexico	1,000 00	500 00	500 00
Salaries of the governor, judges, &c., of the Territory of Utah	13,500 00	2,625 00	10,875 00
Contingent expenses of the Territory of Utah	1,000 00	500 00	500 00
Salaries of the governor, judges, &c., of the Territory of Washington	14,000 00		14,000 00
Contingent expenses of the Territory of Washington	1,000 00	500 00	500 00
Salaries of the governor, judges, &c., of the Territory of Wyoming	13,800 00		13,800 00
Legislative expenses of the Territory of Wyoming	1,500 00		1,500 00
Contingent expenses of the Territory of Wyoming	1,000 00	500 00	500 00
Salaries, &c., of the government of the District of Columbia	27,880 00	5,000 00	22,880 00
Salaries, office of depositary at Tucson, Arizona	1,500 00		1,500 00
Salaries, office of assistant treasurer at—			
Baltimore	23,940 00	5,935 00	18,005 00
Boston	32,860 00	8,215 00	24,645 00
Charleston	9,560 00	2,390 00	7,170 00
New Orleans	14,340 00	3,585 00	10,755 00
New York	148,942 00	36,360 09	112,581 91
Philadelphia	36,320 00	9,080 00	27,240 00

D.—Statement of appropriations for the service of the fiscal year ending June 30, 1873, &c.—Continued.

Appropriations.			
	Appropriated for fiscal year ending June 30, 1873.	Expended during first quarter fiscal year.	Available for re-maintaining three quarters fiscal year.
TREASURY—Continued.			
Salaries, office of assistant treasurer at—			
Saint Louis.....	\$15,800 00	\$3,950 00	\$11,850 00
San Francisco.....	20,660 00	5,165 00	15,495 00
Rent of office at Saint Louis.....	3,500 00	.....	3,500 00
Salaries, office of depository at—			
Chicago.....	10,060 00	2,515 00	7,545 00
Cincinnati.....	11,260 00	2,875 00	8,385 00
Louisville.....	5,420 00	1,355 00	4,065 00
Pittsburgh.....	3,920 00	980 00	2,940 00
Santa Fé.....	4,640 00	1,160 00	3,480 00
Salaries of additional clerks, independent treasury.....	10,000 00	.....	10,000 00
Salaries of special agents, independent treasury.....	6,000 00	6,000 00	.....
Checks and certificates of deposits, independent treasury.....	13,000 00	.....	13,000 00
Contingent expenses, independent treasury.....	100,000 00	29,764 66	70,235 34
Expenses, national currency.....	100,000 00	39,927 61	60,072 39
Suppressing counterfeiting and fraud.....	125,000 00	30,042 81	94,957 19
Redeeming and re-issuing minor coinage.....	20,000 00	.....	20,000 00
Recoinage of gold coin.....	150,000 00	.....	150,000 00
Salaries, Mint at Philadelphia.....	37,900 00	9,475 00	28,425 00
Wages of workmen at the Mint at Philadelphia.....	125,000 00	31,250 00	93,750 00
Contingent expenses of the Mint at Philadelphia.....	35,600 00	8,900 00	26,700 00
Freight on bullion.....	5,000 00	1,250 00	3,750 00
Salaries, branch mint at Carson City, Nevada.....	17,900 00	4,475 00	13,425 00
Wages of workmen at the branch mint at Carson City, Nevada.....	54,000 00	13,500 00	40,500 00
Contingent expenses of the branch mint at Carson City, Nevada.....	17,600 00	11,700 00	5,900 00
Salaries, branch mint at Charlotte, North Carolina.....	1,500 00	.....	1,500 00
Wages of workmen at the branch mint at Charlotte, North Carolina.....	1,492 00	120 00	1,372 00
Contingent expenses of the branch mint at Charlotte, North Carolina.....	1,500 00	.....	1,500 00
Salaries, branch mint at Denver, Colorado.....	10,400 00	2,200 00	8,200 00
Wages of workmen at the branch mint at Denver, Colorado.....	15,335 00	3,869 00	11,466 00
Contingent expenses of the branch mint at Denver, Colorado.....	5,000 00	1,804 98	3,195 02
Salaries, branch mint at San Francisco, California.....	30,500 00	7,625 00	22,875 00
Wages of workmen at the branch mint at San Francisco, California.....	200,000 00	50,000 00	150,000 00
Contingent expenses of the branch mint at San Francisco, California.....	59,545 00	14,886 25	44,658 75
Salaries, assay-office at Boise City, Idaho.....	5,400 00	2,700 00	2,700 00
Wages of workmen at the assay-office at Boise City, Idaho.....	3,000 00	1,500 00	1,500 00
Contingent expenses of the assay-office at Boise City, Idaho.....	1,500 00	850 00	650 00
Salaries, assay-office at New York.....	25,700 00	6,000 00	19,700 00

Wages of workmen at the assay-office at New York.....	62, 000 00	17, 700 00	50, 300 00
Contingent expenses of the assay-office at New York.....	22, 000 00	8, 000 00	14, 000 00
Survey of the Atlantic and Gulf coast.....	391, 000 00	106, 000 00	285, 000 00
Astronomical observations.....	2, 000 00	2, 000 00	.....
Survey of the western coasts.....	200, 000 00	66, 000 00	174, 000 00
Geodetic surveying, Coast Survey.....	36, 000 00	15, 000 00	21, 000 00
Pay and rations of engineers, Coast Survey.....	10, 000 00	4, 000 00	6, 000 00
Vessels for the Coast Survey.....	45, 000 00	30, 000 00	15, 000 00
Publishing observations for the Coast Survey.....	10, 000 00	3, 000 00	7, 000 00
Construction of revenue vessels.....	200, 000 00	421 20	199, 578 80
Revenue-cutter service.....	1, 078, 397 88	221, 535 17	856, 862 71
Supplies of light-houses.....	331, 717 00	105, 388 08	226, 328 92
Repairs and incidental expenses of light-houses.....	260, 000 00	71, 475 80	128, 524 20
Salaries of keepers of light-houses.....	439, 200 00	106, 552 38	332, 647 62
Expenses of light-vessels.....	261, 647 50	68, 024 86	193, 622 64
Expenses of buoyage.....	275, 000 00	89, 640 99	185, 359 01
Expenses of fog-signals.....	50, 000 00	15, 642 00	34, 358 00
Inspecting lights.....	2, 000 00	2, 000 00	.....
Heating apparatus for public buildings.....	75, 000 00	22, 700 25	52, 299 75
Pay of custodians and janitors.....	125, 000 00	13, 000 00	112, 000 00
Repairs and preservation of public buildings.....	200, 000 00	25, 000 00	175, 000 00
Furniture and repairs of same for public buildings.....	150, 000 00	26, 041 06	123, 958 94
Fuel, light, and water for public buildings.....	225, 000 00	194, 319 64	30, 680 36
Refunding certain duties paid by the Winona and Saint Peter's Railroad Company.....	3, 424 28	.....	3, 424 28
Preserving life and property from shipwrecked vessels.....	147, 720 00	.....	147, 720 00
Preserving life and property from shipwrecked vessels, contingent expenses.....	15, 000 00	3, 102 04	11, 897 96
Marine hospital service.....	125, 000 00	61, 436 26	63, 563 74
Custom-house at—			
Machias, Maine.....	2, 000 00	2, 000 00	.....
Ogdensburg, New York.....	3, 000 00	.....	3, 000 00
Baltimore, Maryland.....	50, 000 00	34, 016 00	15, 984 00
Cincinnati, Ohio.....	700, 000 00	180 70	699, 819 30
Collection of captured and abandoned property.....	150, 000 00	75, 000 00	75, 000 00
Collecting mining statistics.....	15, 000 00	8, 000 00	7, 000 00
Expenses of inquiry concerning food-fishes.....	5, 000 00	2, 000 00	3, 000 00
Propagation of food-fishes.....	15, 000 00	6, 000 00	9, 000 00
Promoting the efficiency of the civil service.....	25, 000 00	.....	25, 000 00
Support, &c., transient paupers.....	12, 000 00	2, 000 00	10, 000 00
Contingent expenses, steamboat-inspection service.....	91, 000 00	1, 694 80	89, 305 20
Salaries, steamboat-inspection service.....	165, 400 00	40, 000 00	125, 400 00
Conveying votes of electors for President and Vice-President.....	25, 000 00	.....	25, 000 00
Salaries of ministers.....	379, 250 00	73, 600 00	305, 650 00
Salaries of secretaries of legation.....	37, 675 00	442 66	37, 232 34
Contingent expenses, foreign intercourse.....	100, 000 00	1, 261 80	98, 738 20
Salary of private amanuensis of minister to Great Britain.....	2, 500 00	2, 500 00	.....
Salaries of interpreters to consulates in China, Japan, Siam, and Turkey.....	5, 700 00	.....	5, 700 00
Salaries of marshals for consular courts.....	7, 700 00	.....	7, 700 00
Salaries of consuls, &c.....	426, 000 00	683 17	425, 316 83
Expenses for interpreters, guards, &c., in Turkish dominions.....	3, 000 00	.....	3, 000 00
Bringing home criminals.....	5, 000 00	205 90	4, 794 10
Rescuing shipwrecked American seamen.....	5, 000 00	.....	5, 000 00
Expenses under neutrality act.....	20, 000 00	.....	20, 000 00

D.—Statement of appropriations for the service of the fiscal year ending June 30, 1873, &c.—Continued.

Appropriations.			
	Appropriated for the fiscal year ending June 30, 1873.	Expended during the first quarter of fiscal year.	Available for the remaining three quarters of the fiscal year.
TREASURY—Continued.			
Scheldt dues.....	\$66,584 00	.....	\$66,584 00
Salaries and expenses of the commission between United States and Great Britain.....	74,160 00	\$43,185 83	30,974 17
Annual expenses of Cape Spartal light, coast of Morocco.....	285 00	.....	285 00
Commissioners to the penitentiary congress at London.....	5,000 00	5,000 00	.....
Commissioners to the statistical congress at St. Petersburg.....	5,000 00	5,000 00	.....
Survey of the boundary between the United States and British possessions.....	50,000 00	20,000 00	30,000 00
Salaries of the commission between the United States and Mexico.....	23,700 00	5,350 22	18,349 78
Contingent expenses of the commission between the United States and Mexico.....	5,000 00	2,000 00	3,000 00
Relief and protection of American seamen.....	80,000 00	1,402 00	78,598 00
Salaries and expenses of commission between United States and Spain.....	15,000 00	1,749 99	13,250 01
Prisons for American convicts.....	21,250 00	.....	21,250 00
Contingent expenses of consuls.....	60,000 00	8 33	59,991 67
Assessing and collecting internal revenue, 1873.....	4,700,000 00	1,115,871 66	3,584,128 34
Punishment for violation of internal revenue, 1873.....	80,000 00	232 26	79,767 74
Stamps, paper, and dies, 1873.....	400,000 00	69,975 29	330,024 71
Relief of Moritz Augerstein, 1873.....	7,500 00	7,500 00	.....
Relief of Horace B. Shepard, 1873.....	1,006 75	.....	1,006 75
Relief of Peck, Van Hook & Co., 1873.....	11,564 50	.....	11,564 50
Total, Treasury.....	32,741,320 65	5,916,303 42	26,840,457 52
WAR—CIVIL.			
Statue of General J. A. Rawlins.....	10,000 00	.....	10,000 00
Washington Aqueduct.....	70,555 00	25,000 00	45,555 00
Salaries of employés, public buildings under Chief Engineer.....	45,004 00	11,320 00	33,684 00
Improvement and care of public grounds.....	143,100 00	45,000 00	98,100 00
Contingent expenses, office of Public Buildings and Grounds.....	2,000 00	500 00	1,500 00
Repairs of navy-yard and upper bridges.....	3,000 00	1,000 00	2,000 00
Lighting Capitol and Executive Mansion.....	61,000 00	12,000 00	49,000 00
Repairs, fuel, &c., Executive Mansion.....	40,000 00	16,000 00	24,000 00
Repairs of water-pipes and fire-plugs.....	10,000 00	6,000 00	4,000 00
Chain Bridge, Potomac River.....	100,000 00	2,000 00	98,000 00
Salaries of superintendent and watchmen at building corner of F and Fifteenth streets.....	5,290 00	1,322 50	3,967 50
Salaries of superintendent and watchmen at building corner of F and Seventeenth streets.....	4,570 00	1,142 50	3,427 50
Salaries of additional clerks, and contingent expenses, War Department.....	75,680 00	16,088 00	59,592 00
Contingent expenses, building corner of F and Seventeenth streets.....	7,500 00	500 00	7,000 00

Contingent expenses, building corner of F and Fifteenth streets.....	12,500 00	2,900 00	10,500 00
Salaries, office of Secretary of War.....	47,220 00	11,803 80	35,416 20
Contingent expenses, office of Secretary of War.....	7,000 00	3,300 00	3,700 00
Salaries, office of Adjutant-General.....	90,680 00	22,670 00	68,010 00
Contingent expenses, office of Adjutant-General.....	10,000 00	500 00	9,500 00
Salaries, office of Quartermaster-General.....	172,000 00	43,002 50	128,997 50
Contingent expenses, office of Quartermaster-General.....	5,000 00	1,200 00	3,800 00
Salaries, office of Commissary-General.....	35,080 00	8,770 00	26,310 00
Contingent expenses, office of Commissary-General.....	6,000 00	1,300 00	4,700 00
Salaries, office of Surgeon-General.....	17,560 00	4,390 00	13,170 00
Contingent expenses, office of Surgeon-General.....	8,000 00	1,000 00	7,000 00
Salaries, office of Paymaster-General.....	71,880 00	17,970 00	53,910 00
Contingent expenses, office of Paymaster-General.....	5,000 00	500 00	4,500 00
Salaries, office of Chief Engineer.....	25,760 00	6,440 00	19,320 00
Contingent expenses, office of Chief Engineer.....	3,000 00	500 00	2,500 00
Salaries, office of Chief of Ordnance.....	24,240 00	6,060 00	18,180 00
Contingent expenses, office of Chief of Ordnance.....	1,000 00	300 00	700 00
Salaries, office of chief of Signal-Office.....	2,800 00	760 00	2,100 00
Salaries, office of Inspector-General.....	1,600 00	400 00	1,200 00
Salaries, Bureau of Military Justice.....	4,800 00	1,200 00	3,600 00
Contingent expenses, Bureau of Military Justice.....	500 00	100 00	400 00
Salaries, watchmen, War Department building.....	4,570 00	1,142 50	3,427 50
Contingent expenses, War Department building.....	10,000 00	5,500 00	4,500 00
Total, War-Civil.....	1,143,889 00	278,621 80	865,267 20

INTERIOR—CIVIL.

Salaries, office of Secretary of the Interior.....	47,540 00	10,000 00	37,540 00
Contingent expenses, office of Secretary of the Interior.....	12,000 00	3,000 00	9,000 00
Salaries, General Land-Office.....	260,560 00	62,000 00	198,560 00
Contingent expenses, General Land-Office.....	20,000 00	10,000 00	10,000 00
Salaries, office of Commissioner of Indian Affairs.....	60,280 00	15,000 00	45,280 00
Contingent expenses, office of Commissioner of Indian Affairs.....	5,000 00	1,500 00	3,500 00
Salaries, office of Commissioner of Pensions.....	435,780 00	117,000 00	318,780 00
Contingent expenses, office of Commissioner of Pensions.....	75,000 00	30,000 00	45,000 00
Rent of rooms for Pension-Office.....	16,000 00	4,000 00	12,000 00
Salaries, office of Commissioner of Patents.....	467,800 00	126,000 00	341,800 00
Contingent expenses, office of Commissioner of Patents.....	90,000 00	35,000 00	55,000 00
Plates for Patent-Office Official Gazette.....	40,000 00	20,000 00	20,000 00
Copies of drawings, office of Commissioner of Patents.....	40,000 00	15,000 00	25,000 00
Photo-lithographing, office of Commissioner of Patents.....	40,000 00	10,000 00	30,000 00
Salaries and expenses, office of Commissioner of Education.....	34,850 00	10,000 00	24,850 00
Salaries, watchmen, Department of the Interior.....	21,360 00	5,340 00	16,020 00
Fuel, lights, &c., Department of the Interior.....	18,200 00	4,000 00	14,200 00
Repairs of building, Department of the Interior.....	10,000 00	2,500 00	7,500 00
Packing, &c., congressional documents.....	5,000 00	1,500 00	3,500 00
Jail for the District of Columbia.....	300,000 00	.....	300,000 00
Maps to illustrate the quarto volumes Ninth Census.....	25,000 00	.....	25,000 00
Current expenses, Columbia Institution for the Deaf and Dumb.....	48,000 00	24,000 00	24,000 00
Improving grounds, Columbia Institution for the Deaf and Dumb.....	76,000 00	76,000 00	.....
Current expenses, Columbia Hospital for Women and Lying-in Asylum.....	18,300 00	12,500 00	5,800 00

D.—Statement of appropriations for the service of the fiscal year ending June 30, 1873, &c.—Continued.

Appropriations.	Appropriated for fiscal year ending June 30, 1873.	Expended during first quarter fiscal year.	Available for re-maining three quarters fiscal year.
INTERIOR—CIVIL—Continued.			
Building Columbia Hospital for Women, and Lying-in Asylum.....	\$32,000 00	\$25,000 00	\$7,000 00
Current expenses, Government Hospital for the Insane.....	125,000 00	.....	125,000 00
Improvement of buildings, Government Hospital for the Insane.....	43,800 00	.....	43,800 00
Grounds, Government Hospital for the Insane.....	10,000 00	.....	10,000 00
Salaries and expenses, Metropolitan Police.....	207,890 00	53,000 00	154,890 00
Current expenses, National Soldiers and Sailors' Orphans' Home.....	15,000 00	15,000 00	.....
Buildings and grounds, Reform-school, District of Columbia.....	100,000 00	100,000 00	.....
Preservation of collections, Smithsonian Institution.....	15,000 00	.....	15,000 00
Completing hall, Smithsonian Institution.....	10,000 00	.....	10,000 00
Filling the Washington Canal.....	68,365 00	68,230 00	135 00
Paving roadway, sidewalks, and curbing in the District of Columbia.....	192,620 00	190,050 12	2,569 88
Hospital building in Judiciary Square.....	3,000 00	.....	3,000 00
Capitol Extension.....	50,000 00	10,000 00	40,000 00
Annual repairs, Capitol.....	10,000 00	2,500 00	7,500 00
Extension of Capitol grounds.....	400,000 00	20 00	399,980 00
New dome of Capitol.....	4,000 00	1,000 00	3,000 00
Pneumatic tube from the Capitol to the Government Printing-Office.....	15,000 00	.....	15,000 00
Heating-apparatus, Library of Congress.....	2,000 00	2,000 00	.....
Law library for the Territory of Colorado.....	2,500 00	.....	2,500 00
Salaries and commissions of registers and receivers.....	451,200 00	89,462 89	361,737 11
Contingent expenses of the several land-offices.....	50,175 00	9,923 47	40,251 53
Expenses of depositing public moneys.....	13,000 00	1,831 20	11,168 80
Depredations on public timber.....	10,000 00	240 00	9,760 00
Salaries, office of surveyor-general of Arizona.....	7,000 00	.....	7,000 00
Contingent expenses, office of surveyor-general of Arizona.....	2,500 00	.....	2,500 00
Salaries, office of surveyor-general of California.....	29,000 00	.....	29,000 00
Contingent expenses, office of surveyor-general of California.....	7,000 00	631 00	6,369 00
Salaries, office of surveyor-general of Colorado.....	9,300 00	.....	9,300 00
Contingent expenses, office of surveyor-general of Colorado.....	2,000 00	.....	2,000 00
Salaries, office of surveyor-general of Dakota.....	14,600 00	204 89	14,395 11
Contingent expenses, office of surveyor-general of Dakota.....	2,000 00	21 60	1,978 40
Salaries, office of surveyor-general of Florida.....	6,200 00	.....	6,200 00
Contingent expenses, office of surveyor-general of Florida.....	1,500 00	.....	1,500 00
Salaries, office of surveyor-general of Idaho.....	11,000 00	.....	11,000 00
Contingent expenses, office of surveyor-general of Idaho.....	2,500 00	.....	2,500 00
Salaries, office of surveyor-general of Kansas.....	9,500 00	.....	9,500 00

Contingent expenses, office of surveyor-general of Kansas.....	2,000 00		2,000 00
Salaries, office of surveyor-general of Louisiana.....	6,200 00		6,200 00
Contingent expenses, office of surveyor-general of Louisiana.....	2,500 00		2,500 00
Salaries, office of surveyor-general of Minnesota.....	12,000 00	88 45	11,911 55
Contingent expenses, office of surveyor-general of Minnesota.....	2,200 00		2,200 00
Salaries, office of surveyor-general of Montana.....	9,000 00		9,000 00
Contingent expenses, office of surveyor-general of Montana.....	2,000 00	46 00	1,954 00
Salaries, office of surveyor-general of Nebraska and Iowa.....	14,600 00		14,600 00
Contingent expenses, office of surveyor-general of Nebraska and Iowa.....	2,000 00		2,000 00
Salaries, office of surveyor-general of Nebraska and Iowa.....	9,300 00		9,300 00
Contingent expenses, office of surveyor-general of Nevada.....	3,700 00		3,700 00
Salaries, office of surveyor-general of Nevada.....	9,300 00	126 36	9,173 64
Contingent expenses, office of surveyor-general of Nevada.....	2,000 00		2,000 00
Salaries, office of surveyor-general of New Mexico.....	7,900 00		7,900 00
Contingent expenses, office of surveyor-general of New Mexico.....	2,000 00		2,000 00
Salaries, office of surveyor-general of Oregon.....	7,700 00		7,700 00
Contingent expenses, office of surveyor-general of Oregon.....	1,800 00		1,800 00
Salaries, office of surveyor-general of Utah.....	9,500 00	101 09	9,398 91
Contingent expenses, office of surveyor-general of Washington Territory.....	2,000 00		2,000 00
Salaries, office of surveyor-general of Washington Territory.....	9,000 00		9,000 00
Contingent expenses, office of surveyor-general of Wyoming.....	2,500 00		2,500 00
Salaries, office of surveyor-general of Wyoming.....	15,000 00		15,000 00
Surveying public lands in—			
Arizona.....	60,000 00		60,000 00
California.....	50,000 00		50,000 00
Colorado.....	60,000 00		60,000 00
Dakota.....	18,000 00		18,000 00
Florida.....	30,000 00		30,000 00
Idaho.....	70,000 00		70,000 00
Kansas.....	18,000 00		18,000 00
Louisiana.....	75,000 00	132 55	74,867 45
Minnesota.....	50,000 00	3,066 27	46,933 73
Montana.....	60,000 00		60,000 00
Nebraska.....	50,000 00		50,000 00
Nevada.....	20,000 00		20,000 00
New Mexico.....	70,000 00		70,000 00
Oregon.....	16,000 00		16,000 00
Utah.....	70,000 00		70,000 00
Washington Territory.....	40,000 00		40,000 00
Wyoming.....	92,000 00	20,668 41	71,331 59
Survey between the 96th and 98th meridians, Indian Territory.....	75,000 00	50,000 00	25,000 00
Geological survey of the Territories.....	3,500 00		3,500 00
Maps of the public lands.....	20,000 00	20,000 00	
Survey of the Colorado of the West.....	41,250 00		41,250 00
Survey of eastern boundary of California.....	8,800 00		8,800 00
Survey of northern boundary of Nebraska.....	15,500 00		15,500 00
Survey of northern boundary of Nevada.....	8,400 00		8,400 00
Survey of western boundary of Kansas.....	22,200 00		22,200 00
Survey of southern boundary of Wyoming.....			
Total, Interior—Civil.....	5,285,170 00	1,253,684 30	4,031,485 70

D.—Statement of appropriations for the service of the fiscal year ending June 30, 1873, &c.—Continued.

UNEXPENDED BALANCES OF APPROPRIATIONS.

Appropriations.			
	Appropriated for fiscal year ending June 30, 1873.	Expended during first quarter fiscal year.	Available for re-maintaining, three quarters, fiscal year.
INTERIOR—PENSIONS AND INDIANS.			
Army pensions.....	\$30,000,000 00	\$8,979,000 00	\$21,021,000 00
Navy pensions	480,000 00	157,100 00	322,900 00
Total, Interior—Pensions and Indians	30,480,000 00	9,136,100 00	21,343,900 00
WAR.			
Pay of the Army.....	12,105,591 32	3,320,533 88	8,785,057 44
Pay of Military Academy	222,937 50	32,000 00	190,937 50
Mileage.....	240,000 00	64,840 00	175,160 00
General expenses.....	100,000 00	33,200 00	66,800 00
Subsistence of the Army.....	2,770,944 00	373,238 00	2,397,706 00
Regular supplies of the Quartermaster's Department.....	4,000,000 00	1,253,510 28	2,746,489 72
Incidental expenses of the Quartermaster's Department.....	1,200,000 00	478,256 06	721,743 94
Barracks and quarters.....	1,250,000 00	574,008 02	675,991 98
Transportation of the Army and supplies	4,000,000 00	869,866 29	3,130,133 71
Horses for cavalry and artillery	300,000 00	101,000 00	199,000 00
Clothing, camp, and garrison equipage.....	770,000 00	342,572 12	427,427 88
National cemeteries	450,000 00	57,145 43	392,854 57
Heating and cooking stoves	10,000 00	10,000 00	.....
Ordinance service	200,000 00	53,761 00	146,239 00
Ordinance stores and supplies.....	383,000 00	125,747 62	257,252 38
Manufacture of arms at national armories.....	150,000 00	.....	150,000 00
Tests of heavy rifled-ordnance.....	270,000 00	750 00	269,250 00
Springfield arsenal, Massachusetts.....	22,000 00	4,000 00	18,000 00
Kennebec arsenal, Maine.....	1,000 00	250 00	750 00
Watertown arsenal, Massachusetts.....	8,000 00	1,000 00	7,000 00
Watervliet arsenal, New York	1,500 00	375 00	1,125 00
New York arsenal, New York.....	17,600 00	7,500 00	10,100 00
Frankford arsenal, Pennsylvania.....	3,000 00	711 00	2,289 00
Washington arsenal, District of Columbia.....	3,000 00	3,000 00	.....
Fort Monroe arsenal, Virginia.....	6,000 00	4,000 00	2,000 00
Charleston arsenal, South Carolina	2,700 00	2,500 00	200 00
San Antonio arsenal, Texas.....	16,000 00	10,300 00	5,700 00
Columbus arsenal, Ohio.....	950 00	400 00	550 00

Detroit arsenal, Michigan	500 00	500 00	454,800 00
Rock Island arsenal, Illinois	752,000 00	297,300 00	2,250 00
Saint Louis arsenal, Missouri	3,000 00	12,047 40	3,000 00
Leavenworth arsenal, Kansas	12,047 40	19,000 00	25,352 00
Fort Union arsenal, New Mexico	3,500 00	1,000 00	7,950 00
Benicia arsenal, California	44,352 00	2,050 00	105,000 00
Vancouver arsenal, Washington Territory	1,000 00	70,000 00	13,000 00
Contingencies of arsenals	10,000 00	13,000 00	10,000 00
Survey of Northern and Northwestern lakes	175,000 00	40,000 00	35,000 00
Engineer depot at Willett's Point	26,000 00	2,000 00	29,690 43
Trial with torpedoes	10,000 00	25,000 00	38,045 00
Military and geographical surveys west of the Mississippi	75,000 00	7,000 00	8,800 00
Survey of Fort Gratiot military reservation	2,000 00	6,818 82	7,500 00
Rock Island bridge	47,000 00	20,826 67	99,753 33
Current and ordinary expenses Military Academy	63,045 00	2,575 00	2,425 00
Miscellaneous and incidental expenses, Military Academy	15,800 00	12,500 00	
Re-imbursing cadets for losses incurred by fire, Military Academy	6,818 82	250,000 00	
Buildings and grounds, Military Academy	17,500 00		
Expenses of recruiting	120,580 00		
Contingencies of the Adjutant-General's Department	5,000 00		
Signal-service	12,500 00		
Observations and reports of storms	250,000 00		
Expenses of commanding general's office	5,000 00		
Medical and hospital department	300,000 00		
Medical and Surgical History	60,000 00		
Appliances for disabled and volunteer soldiers	10,000 00		
Medical Museum and Library	10,000 00		
Construction and repair of hospitals	100,000 00		
Support of Freedman's Hospital and Asylum, District of Columbia	74,000 00		
Support of Bureau Refugees, Freedmen and Abandoned Lands	100,000 00		
Contingencies of the Army	75,000 00		
Expenses of sales of stores and materials	10,000 00		
Secret-service fund	50,000 00		
Horses and other property lost in the military service	100,000 00		
Re-imbursing the State of Kansas for expenses in suppressing the rebellion	337,054 38		
Re-imbursing the State of Kentucky for expenses in suppressing the rebellion	1,000 000 00		
Refunding to States expenses incurred in raising volunteers	500,000 00		
Bronze equestrian statue of Lieutenant-General Winfield Scott	42,000 00		
Expenses military convicts	65,000 00		
Payment of Benn Pitman for copy of record in case of General D. C. Buell	1,200 00		
Total War	32,996,120 42	9,627,412 08	23,368,708 34

NAVY.

Pay of the Navy	6,250,000 00	2,836,631 63	3,413,368 37
Naval Academy	193,408 25	68,000 00	125,408 25
Contingent, Navy	100,000 00	21,881 57	78,118 43
Pay, Marine Corps	678,145 00	126,700 00	551,445 00
Provisions, Marine Corps	126,501 70	25,000 00	101,501 70
Clothing, Marine Corps	129,650 00	50,000 00	79,650 00

D.—Statement of appropriations for the service of the fiscal year ending June 30, 1873, &c.—Continued.

Appropriations.	Appropriated for fiscal year end- ing June 30, 1873.	Expended during first quarter fiscal year.	Available for re- maining three quarters fiscal year.
NAVY—Continued.			
Fuel, Marine Corps.....	\$30,856 00	\$5,000 00	\$25,856 00
Military stores, Marine Corps.....	10,000 00	1,000 00	9,000 00
Transportation and recruiting, Marine Corps.....	12,000 00	1,000 00	11,000 00
Repairs of barracks, Marine Corps.....	10,000 00	2,000 00	8,000 00
Forage for horses, Marine Corps.....	6,000 00	.....	6,000 00
Quarters for officers, Marine Corps.....	16,500 00	.....	16,500 00
Contingent, Marine Corps.....	25,000 00	20,000 00	5,000 00
Navy-yard at—			
Portsmouth, New Hampshire.....	159,000 00	44,732 00	114,268 00
Boston, Massachusetts.....	87,000 00	22,238 00	64,762 00
New York, New York.....	100,000 00	14,044 00	85,956 00
Philadelphia, Pennsylvania.....	40,000 00	7,521 00	32,479 00
Washington, District of Columbia.....	75,000 00	25,786 00	49,214 00
Norfolk, Virginia.....	100,000 00	27,894 00	72,106 00
Pensacola, Florida.....	25,000 00	10,500 00	14,500 00
Mare Island, California.....	410,000 00	79,700 00	330,300 00
Naval station—			
League Island.....	115,000 00	12,542 00	102,458 00
Key West, Florida.....	15,000 00	.....	15,000 00
New London, Connecticut.....	20,000 00	.....	20,000 00
Emergencies at naval stations.....	40,000 00	210 00	39,790 00
Naval Asylum at Philadelphia, Pennsylvania.....	65,100 00	4,987 00	60,113 00
Protecting timber-lands.....	5,000 00	1,098 00	3,902 00
Paving sidewalks and streets adjacent to the navy-yard, Charlestown, Massachusetts.....	1,600 00	.....	1,600 00
Civil establishment, yards and docks.....	89,527 00	22,812 00	66,715 00
Contingent, yards and docks.....	900,000 00	184,682 00	715,318 00
Equipment of vessels.....	1,500,000 00	396,442 39	1,103,557 61
Civil establishment, equipment and recruiting.....	30,000 00	7,767 00	22,233 00
Contingent, equipment and recruiting.....	125,000 00	21,083 00	103,917 00
Navigation and navigation supplies.....	231,500 00	13,622 00	217,878 00
Naval Observatory.....	24,200 00	6,842 00	17,358 00
Refracting telescope.....	10,000 00	.....	10,000 00
Tower for telescope.....	10,000 00	.....	10,000 00
Purchase of instruments for an observation of the transit of Venus.....	50,000 00	91 00	49,909 00
Nautical Almanac.....	24,500 00	4,866 00	19,634 00
Navigation, civil establishment.....	12,000 00	2,759 00	9,241 00

Contingent, Bureau Navigation.....	6,000 00	411 00	5,589 00
Ordnance and ordnance stores.....	755,241 00	121,977 00	633,264 00
Civil establishment, ordnance.....	15,000 00	3,884 00	11,116 00
Contingent, ordnance.....	1,000 00	35 00	965 00
Construction and repair.....	3,300,000 00	1,304,845 00	1,995,155 00
License to use Gorman & Siegfried's process of tempering steel.....	10,000 00	10,000 00	
Right to manufacture and use Emery & Cheney's patent elastic chain-stopper and surge-reliever.....	12,000 00		12,000 00
Civil establishment, construction and repair.....	51,400 00	13,107 00	38,293 00
Steam machinery.....	1,650,000 00	265,301 00	1,384,699 00
Steam machinery, civil establishment.....	40,400 00	10,098 00	30,302 00
Provisions of the Navy.....	1,587,600 00	364,218 00	1,223,382 00
Civil establishment, provisions and clothing.....	14,285 00	2,916 00	11,369 00
Contingent, provisions and clothing.....	75,000 00	7,046 00	67,954 00
Surgeons' necessities.....	40,000 00	1,071 00	38,929 00
Repairs and improvements, medicine and surgery.....	25,000 00	2,304 00	22,696 00
Civil establishment, medicine and surgery.....	73,372 00	19,102 00	54,270 00
Contingent, medicine and surgery.....	25,000 00	4,679 00	20,321 00
Payment to officers and crew of United States steamer Kearsarge for destruction of the Alabama.....	160,772 62	5,902 99	154,869 63
Experimental breech-loading boat-howitzers.....	10,000 00		10,000 00
Total, Navy.....	19,704,558 57	6,206,348 58	13,498,209 99

* Balances from other appropriations, in excess of the amount appearing here as an overdraft, were due to this account, but not transferred until the following month.

CONTRACTS AND PURCHASES OF THE WAR DEPARTMENT.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

Statements showing the contracts and purchases made by the Ordnance, Subsistence, Quartermaster-General's, Chief of Engineers', and the Signal Bureaus of his Department, during the year ended December 31, 1872.

JANUARY 30, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

WAR DEPARTMENT, *January 24, 1873.*

The Secretary of War has the honor to submit to the United States Senate and House of Representatives, in compliance with the requirements of the acts of April 21, 1808, and March 3, 1809, duplicate statements showing the contracts and purchases made by the Ordnance, Subsistence, Quartermaster General's, Chief of Engineers', and the Signal Bureaus of this Department during the year ended December 31, 1872.

Similar statements from the other Bureaus will be forwarded at an early day.

WM. W. BELKNAP,
Secretary of War.

Statement of contracts made and orders given by the Ordnance Department during the year ended December 31, 1872.

Name of contractor.	Articles contracted for or ordered.	Place of delivery.	Number or quantity.	Price.	Amount.	Date of contract or order.
E. J. Du Pont & Company..... United States Cartridge Company, Lowell, Massachusetts.	Musket powder..... Metallic cartridges, caliber .50.....	Frankford arsenal..... .....do.....	5,000 pounds. 10,000	\$0 20 *35 00	\$1,000 00 350 00	Jan. 24, 1872 Feb. 19, 1872
E. J. Du Pont & Company..... Do..... Do.....	Mammoth powder explosive..... Cake powder explosive..... Mammoth powder explosive.....	Fort Monroe arsenal..... do..... do.....	1,000 pounds. 300 pounds. 2,500 pounds.	..... ..... .....	..... ..... .....	June 19, 1872 June 24, 1872 Oct. 2, 1872
Baltimore Bridge Company.....	Materials for bridge and services of an agent in erecting same at Rock Island arsenal.	Rock Island arsenal.....	.....	.....	4,392 10	June 18, 1872
American Waterproofing Company.....	Waterproofing material for 500 valises and haver- sacks.	Watervliet arsenal.....	.....	.....	.....	July 22, 1872
W. A. Steel, Joliet, Illinois.....	Building-stone.....	Rock Island arsenal.....	.....	†8 90 †9 40	 }	Aug. 6, 1872

* Per thousand.

† Per yard for dam wall.

‡ Per yard for soldiers' barracks.

Statement of purchases made by the Ordnance Department, under the direction of the Secretary of War, during the year 1872, furnished in compliance with the fifth section of the "Act for the establishment and regulation of the War Department," approved March 3, 1809.

From whom purchased.	Date.	Articles purchased.	Price.	Amount.	Date of order or contract.	To whom delivered.	Place of delivery.	Date of delivery.
C. Alger & Company...	Dec. 5, 1872	3 15-inch Rodman guns.....	\$6,000 00	\$18,000 00	July 3, 1871	Capt. B. H. Gilbreth, ord- nance store-keeper.	Watertown arsenal.....	Nov. 30, 1872
James Moore.....	April 27, 1872	20 10-inch rifle projectiles.....	.....	646 93	.....	Capt. William Adams, ord- nance store-keeper.	Fort Monroe arsenal.....	.....
Colt's Patent Fire-arms Manufacturing Com- pany.	Jan. 2, 1872	Altering 126 revolvers to use the metallic cartridge.	3 50	441 00	Jan. 31, 1871	Maj. E. Ingersoll, ordnance store-keeper.	Springfield armory.....	Dec. 29, 1871
Colt's Patent Fire-arms Manufacturing Com- pany.	.....	Parts of breech-loading pis- tols furnished.	.....	832 86	.....	.....	.....	.....
United States Cartridge Company.	Dec. 31, 1872	10,000 metallic cartridges, cal- iber .50.	*35 00	350 00	Feb. 19, 1872	Lieut. M. L. Poland.....	Frankford arsenal.....	Dec. 14, 1872

* Per thousand.

Statement of contracts made in the Subsistence Department during the fiscal year ended June 30, 1872.

Station.	By whom made.	Contractor.	Date.	Commencing.	Ending.	Article.	Price.	Remarks.
Raleigh, N. C.	Maj. W. W. Burns.	A. H. Temple.	July 1, 1871	July 1, 1871	Dec. 31, 1871	Fresh beef.	\$0 1250	In quarters.
Fort Adams, R. I.	do	Chas. Spooner.	July 10, 1871	Aug. 1, 1871	Jan. 31, 1872	do	25	Sales.
Do.	do	do	do	do	do	do	16	In quarters.
Fort Johnson, N. C.	do	W. W. McRackan.	July 1, 1871	July 1, 1871	Dec. 31, 1871	do	10	Do.
David's Island, N. Y.	do	Victor Linkert.	July 10, 1871	July 10, 1871	Jan. 10, 1872	do	23	Sales.
Fort Porter, N. Y.	Capt. J. P. Hawkins	Peter Burgard.	July 11, 1871	July 21, 1871	Dec. 31, 1871	do	08	In quarters.
Willet's Point, N. Y.	Lt. C. E. L. B. Davis.	Jacob Varian.	Aug. 1, 1871	Aug. 3, 1871	Feb. 2, 1872	do	1347	Do.
Mount Vernon, Ky.	Maj. T. J. Haines.	Redd & McClure.	July 31, 1871	Aug. 1, 1871	June 30, 1872	do	0950	Do.
Fort Brady, Mich.	Capt. J. P. Hawkins	L. P. Trimpe.	July 26, 1871	do	Aug. 31, 1872	do	16	Do.
Fort Macon, N. C.	Maj. W. W. Burns.	Thos. Daniels.	July 1, 1871	July 1, 1871	Dec. 31, 1871	do	15	Do.
Phattsburgh Bks., N. Y.	do	P. McKeefe.	July 17, 1871	Aug. 10, 1871	Feb. 10, 1872	do	09	Do.
Fort Warren, Mass.	do	Andrew Pratt.	July 20, 1871	July 20, 1871	Jan. 28, 1872	do	1350	Do.
Do.	do	do	do	do	do	Corned beef.	10	Do.
Fort Independence, Mass.	do	do	do	do	do	Fresh beef.	1350	Do.
Do.	do	do	do	do	do	Corned beef.	10	Do.
Fort McIntosh, Tex.	Capt. S. T. Cushing.	R. Sanchez.	July 6, 1871	July 1, 1871	June 30, 1872	Fresh beef.	06	Do.
Omaha, Nebr.	Capt. J. W. Barriger.	J. F. Sheely.	Aug. 5, 1871	Sept. 1, 1871	do	do	0890	Do.
Omaha Barracks, Nebr.	do	do	do	do	do	do	0890	Do.
Omaha, Nebr.	do	do	do	do	do	Fresh beef, mut-	15	Sales.
Do.	do	do	do	do	do	ton, and veal.	do	Do.
Omaha Barracks, Nebr.	do	do	do	do	do	do	15	Do.
Fort Trumbull, Conn.	Maj. W. W. Burns.	Saml. P. Smith.	Aug. 11, 1871	Aug. 12, 1871	Feb. 11, 1872	Fresh beef.	1150	In quarters.
Do.	do	do	do	do	do	do	20	Sales.
Camp Gaston, Cal.	Lt. G. W. Kingsbury	Greenbaum & Chap-	July 1, 1871	July 1, 1871	June 30, 1872	do	0925	In quarters.
Do.	man.	Howell & Morse.	Sept. 7, 1871	Aug. 11, 1871	Feb. 10, 1872	do	26	Sales.
Fort Preble, Me.	Maj. W. W. Burns.	do	Aug. 20, 1871	do	do	do	15	In quarters.
Do.	do	do	Aug. 1, 1871	Aug. 1, 1871	June 30, 1872	do	174	Do.
San Juan Island, Wash.	Capt. W. H. Bell.	W. T. Taylor.	do	do	Dec. 31, 1871	do	18	Sales.
Fort Johnson, N. C.	Maj. W. W. Burns.	W. W. McRackan.	Sept. 19, 1871	Sept. 19, 1871	June 19, 1872	do	0650	In quarters.
Saint Augustine, Fla.	Maj. T. J. Haines.	Gasper Masters.	Sept. 18, 1871	Oct. 1, 1871	June 30, 1872	do	1050	Do.
Savannah, Ga.	do	Ross and Garduer.	Sept. 30, 1871	do	do	do	0975	Do.
Columbus arsenal, Ohio	Capt. E. P. Jones.	W. R. Gault.	Sept. 25, 1871	do	do	do	09	Do.
Humboldt, Tenn.	Maj. T. J. Haines.	L. L. Williams.	Oct. 7, 1871	do	do	do	0875	Do.
Chattanooga, Tenn.	do	Meyer & Clements.	Sept. 30, 1871	do	do	do	10	Do.
Washington, D. C.	Maj. Geo. Bell.	J. T. Varnell.	do	do	do	do	10	Sales.
Do.	do	do	do	do	do	do	06	In quarters.
Do.	do	do	do	do	do	Corned beef.	14	Sales.
Do.	do	do	do	do	do	Mutton.	1199	In quarters.
Fort Bliss, Tex.	Capt. S. T. Cushing.	Louis Cordis.	Sept. 12, 1871	do	June 30, 1872	Fresh beef.	1050	Sales.
Do.	do	do	do	do	do	Beef cattle.	12	In quarters.
Allegheeny arsenal, Pa.	Capt. Isaac Arnold.	J. T. Schlelein.	Oct. 25, 1871	Nov. 1, 1871	Apr. 30, 1872	Fresh and corned	1250	beef.
Watervliet arsenal, N. Y.	Lt. W. S. Beebe.	Sausse & Hartnett.	Oct. 30, 1871	do	Me. 30, 1872	Fresh beef.	1050	Do.
Lebanon, Ky.	Maj. T. J. Haines.	Mackeu & Clements.	Oct. 27, 1871	do	June 30, 1872	do	do	Do.

Statement of contracts made in the Subsistence Department during the fiscal year ended June 30, 1872—Continued.

Station.	By whom made.	Contractor.	Date.	Commencing.	Ending.	Article.	Price.	Remarks.
Huntsville, Ala.	Maj. T. J. Haines.	G. Jacobs	Oct. 23, 1871	Nov. 1, 1871	June 30, 1872	Fresh beef	\$0 0650	In quarters.
Elizabethtown, Ky	Lt. A. E. Smith.	Adam Beckler	Nov. 1, 1871	do	Dec. 31, 1871	do	09	Do.
Charleston, S. C.	Maj. T. J. Haines.	G. J. Cunningham	Oct. 27, 1871	do	June 30, 1872	do	1175	Do.
Fort Barrancas, Fla	do	James Murphy	Oct. 23, 1871	do	do	do	0750	Do.
Rock Island arsenal, Ill.	Lt. E. M. Wright.	Dietz & Yager	Nov. 10, 1871	Nov. 10, 1871	do	do	0940	Do.
Do.	do	do	do	do	do	do	1250	Do.
Watertown arsenal, Mass.	Lt. O. E. Michaelis.	E. D. Jones	Nov. 15, 1871	Nov. 15, 1871	May 15, 1872	do	1350	Do.
Elizabethtown, Ky	Maj. T. J. Haines.	Adam Beeler	Nov. 29, 1871	Dec. 1, 1871	June 30, 1872	do	10	Do.
Fort Columbus, N. Y.	Lt. R. G. Rutherford.	J. M. Evans	Nov. 12, 1871	Jan. 1, 1872	do	do	22	Sales.
New York City.	do	do	do	do	do	do	22	Do.
Fort Columbus, N. Y.	do	Howard Collins	do	do	do	do	1499	In quarters.
New York City.	do	do	do	do	do	do	1499	Do.
Frankford arsenal, Pa	Lt. W. Prince	John Entwisle	Dec. 15, 1871	do	do	do	10	Do.
Fort Foote, Md.	Maj. W. W. Burns.	John R. Gheen	Dec. 8, 1871	do	do	do	15	Do.
Do.	do	do	do	do	do	do	10	Sales.
Fort Hamilton, N. Y.	do	John Walsh	Dec. 15, 1871	do	do	do	1525	In quarters.
Fort McHenry, Md.	do	G. W. Pappier	Dec. 9, 1871	do	do	do	0793	Do.
Do.	do	do	do	do	do	do	15	Do.
Fort Wayne, Mich.	Capt. J. P. Hawkins	Thos. Barlum	Dec. 16, 1871	do	do	do	125 } 105 }	In quarters.
Fort Ontario, N. Y.	do	A. L. Hagenbuch	Dec. 8, 1871	do	do	do	0987	Do.
Fort Whipple, Va.	Lt. G. S. Grimes	J. H. Watkins	Dec. 22, 1871	do	do	do	10	Do.
Do.	do	do	do	do	do	do	15	Sales.
Fort Gratiot, Mich.	Capt. J. P. Hawkins.	Benj. Karrer	Dec. 14, 1871	do	do	do	15	Do.
Do.	do	do	do	do	do	do	14	In quarters.
Fort Wadsworth, N. Y.	Maj. W. W. Burns.	J. M. Evans	Dec. 20, 1871	do	do	do	1299	Do.
Fort Washington, Md.	do	J. H. Watkins	do	do	do	do	0950	Do.
Do.	do	Adams & Murray	do	do	do	do	17	Sales.
Chicago and Barracks, Ill.	Maj. R. Macfeely.	S. Wustum	Dec. 26, 1871	do	do	do	07	In quarters.
David's Island, N. Y.	Maj. W. W. Burns.	Jacob Varian	July 3, 1871	July 10, 1871	Jan. 10, 1872	do	1240	Do.
Fort Bayard, N. Mex.	Capt. W. H. Nash.	Probst & Kirchner	July 5, 1871	Sept. 1, 1871	June 30, 1872	do	0973	Do.
Fort Cummings, N. Mex.	do	do	do	do	do	do	0973	Do.
Fort Marcy, N. Mex.	do	do	do	do	do	do	0973	Do.
Fort Stanton, N. Mex.	do	do	do	do	do	do	0973	Do.
Fort Union, N. Mex.	do	do	do	do	do	do	0973	Do.
Fort Wingate, N. Mex.	do	do	do	do	do	do	0973	Do.
Newport Barracks, Ky.	Lt. Geo. McDermott.	Saml. Morledge	Dec. 27, 1871	Jan. 1, 1872	do	do	0590	Do.
McPherson Barracks, Ga.	Maj. T. J. Haines.	James Terhune	Dec. 26, 1871	do	do	do	09	Do.
Pikesville arsenal, Md	Capt. M. J. Grealish.	August Townner	Dec. 30, 1871	do	do	do	15	Do.
Augusta arsenal, Ga.	Capt. Jas. H. Rollins.	E. Franklin	Dec. 12, 1871	do	do	do	16	Do.
Fort Adams, R. I.	Maj. W. W. Burns.	Chas. Spooner	Jan. 10, 1872	Feb. 1, 1872	do	do	22	Sales.
Do.	do	do	do	do	do	do	10	In quarters.
Fort Wood, N. Y.	do	L. M. Evans	Dec. 28, 1871	Jan. 1, 1872	do	do	1499	Do.
Rock Island arsenal, Ill.	Lieut. W. P. Butler	Dietz & Yager	Jan. 15, 1872	Jan. 15, 1872	do	do	0990	Do.
Columbia, S. C.	Maj. T. J. Haines	W. D. Starling	Jan. 4, 1872	Jan. 1, 1872	do	do	1150	Do.

Fort Macon, N. C.	do	C. F. Delamar	Jan. 3, 1872	do	do	do	do	do	10	do	Do.
Louisville, Ky.	do	James Tomlinson	Dec. 27, 1871	do	do	do	do	do	0650	do	Do.
Fort Sullivan, Me.	do	Simon Stevens	Jan. 12, 1872	do	do	do	do	do	142-5	do	Sales.
Do.	do	do	do	do	do	do	do	do	09	do	In quarters.
Plattsburgh Barracks, N. Y.	do	P. McKeefe	Jan. 22, 1872	do	do	do	do	do	0975	do	Do.
Raleigh, N. C.	do	W. R. Crawford	Jan. 6, 1872	do	do	do	do	do	12	do	Do.
Fort Porter, N. Y.	do	A. Dolk	Dec. 16, 1871	do	do	do	do	do	0775	do	Do.
Fort Niagara, N. Y.	do	B. W. Moon	Dec. 21, 1871	do	do	do	do	do	12	do	Do.
Do.	do	do	do	do	do	do	do	do	15	do	Sales.
Fort Munroe, Va.	do	W. H. Kimberly	Jan. 4, 1872	do	do	do	do	do	1075	do	In quarters.
Mobile, Ala.	do	W. Cottrill	Dec. 30, 1871	do	do	do	do	do	0750	do	Do.
Nashville, Tenn.	do	Adam Coe	Dec. 27, 1871	do	do	do	do	do	0850	do	Do.
Fort Probie, Me.	do	Howell & Morse	Jan. 22, 1872	do	do	do	do	do	20	do	Sales.
Do.	do	do	do	do	do	do	do	do	13	do	In quarters.
Fort Warren, Mass.	do	Andrew Pratt	Jan. 29, 1872	do	do	do	do	do	1350	do	Do.
Do.	do	do	do	do	do	do	do	do	10	do	Do.
Fort Independence, Mass.	do	do	do	do	do	do	do	do	1350	do	Do.
Do.	do	do	do	do	do	do	do	do	10	do	Do.
Fort Munroe, Va.	do	W. H. Kimberly	Feb. 1, 1872	do	do	do	do	do	20	do	Sales.
Do.	do	do	do	do	do	do	do	do	1140	do	In quarters.
Fort Trumbull, Conn.	do	E. Bishop	Feb. 12, 1872	do	do	do	do	do	097	do	Do.
David's Island, N. Y.	do	Geo. Horn	Mar. 1, 1872	do	do	do	do	do	096	do	Do.
Willet's Point, N. Y.	do	Chas. A. Janin	Apr. 1, 1872	do	do	do	do	do	16	do	Do.
All military posts in Ariz.	do	G. W. Grayson	Mar. 9, 1872	do	do	do	do	do	09	do	Do.
Do.	do	do	do	do	do	do	do	do	177	do	Sales.
All Indian reservations in Ariz.	do	do	do	do	do	do	do	do	12	do	In quarters.
Washington, D. C.	do	J. T. Varnell	Apr. 1, 1872	do	do	do	do	do	10	do	Sales.
Do.	do	do	do	do	do	do	do	do	077	do	In quarters.
Do.	do	do	do	do	do	do	do	do	12	do	Sales.
Watervliet arsenal, N. Y.	do	Sause & Hartnett	Apr. 30, 1872	do	do	do	do	do	0404	do	In quarters.
Fort Buford, Dak.	do	James Kelly	Apr. 3, 1872	do	do	do	do	do	0389	do	200 head.
Fort Stevenson, Dak.	do	do	do	do	do	do	do	do	0374	do	100 head.
Fort Ransom, Dak.	do	do	do	do	do	do	do	do	04	do	60 head.
Fort Randall, Dak.	do	W. H. Drake	Apr. 2, 1872	do	do	do	do	do	0384	do	220 head.
Fort Sully, Dak.	do	Thos. Welsh	Apr. 3, 1872	do	do	do	do	do	08	do	520 head.
Frankfort, Ky.	do	M. V. South	May 1, 1872	do	do	do	do	do	13	do	In quarters.
Allegheny arsenal, Pa.	do	J. F. Schlelein	do	do	do	do	do	do	02½	do	Do.
Fort Lyon, Colo.	do	F. Meyer	Apr. 27, 1872	do	do	do	do	do	Per pound,	do	Do.
Do.	do	do	do	do	do	do	do	do	net.	do	Do.
Fort Riley, Kans.	do	Thos. Dixon	Apr. 18, 1872	do	do	do	do	do	10½	do	Do.
Fort Harker, Kans.	do	do	do	do	do	do	do	do	10½	do	Do.
Fort Hays, Kans.	do	do	do	do	do	do	do	do	10½	do	Do.
Fort Wallace, Kans.	do	do	do	do	do	do	do	do	10½	do	Do.
Fort Larned, Kans.	do	P. G. Lowe	Apr. 22, 1872	do	do	do	do	do	10	do	Do.
Fort Dodge, Kans.	do	do	do	do	do	do	do	do	10	do	Do.
Camp Supply, Ind. T.	do	do	do	do	do	do	do	do	10	do	Do.
Fort Leavenworth, Kans.	do	do	do	do	do	do	do	do	07	do	Do.
Leavenworth arsenal, Kans.	do	do	do	do	do	do	do	do	07	do	Do.
Fort Reynolds, Colo.	do	F. Meyer	do	do	do	do	do	do	08½	do	Do.

Location	Agent	Date	Quantity	Unit	Price
Fort Wayne, Mich.	Capt. J. P. Hawkins	June 14, 1872	10	do.	10
Detroit, Mich.	do.	do.	10	do.	10
Fort Wayne, Mich.	do.	do.	12½	do.	12½
Detroit, Mich.	do.	do.	12½	do.	12½
Fort Niagara, N. Y.	do.	do.	15½	do.	15½
Do.	B. W. Moon	do.	16	do.	16
Augusta arsenal, Ga.	do.	do.	12½	do.	12½
Newport Barracks, Ky.	Capt. J. H. Rollins	do.	041	do.	041
Do.	Lt. C. H. Conrad	June 27, 1872	12	do.	12
San Antonio, Tex.	Capt. S. T. Cushing	Dec. 31, 1872	0318	do.	0318
Do.	do.	June 30, 1873	18	do.	18
Do.	do.	do.	03½	do.	03½
Fort Washington, Md.	Maj. W. W. Burns	June 15, 1872	17	do.	17
Do.	Schuler, Adams, & Murray	Dec. 31, 1872	0945	do.	0945
Fort Foote, Md.	do.	Dec. 30, 1872	15	do.	15
Do.	John R. Kelly	Dec. 31, 1872	10½	do.	10½
Fort Trumbull, Conn.	Clark & Smith	do.	108	do.	108
Do.	do.	do.	22	do.	22
Plattsburgh Barracks, N. Y.	do.	do.	07	do.	07
Fort Adams, R. I.	John Leonard	do.	13½	do.	13½
Do.	Chas. Spooner	June 10, 1872	25	do.	25
Fort Hamilton, N. Y.	do.	do.	21½	do.	21½
Do.	John Walsh	June 5, 1872	15½	do.	15½
Fort Clark, Tex.	do.	do.	04½	do.	04½
Do.	James Cornell	May 3, 1872	04½	do.	04½
Fort Gratiot, Mich.	do.	do.	07	do.	07
Do.	Huner & Wilson	June 14, 1872	12½	do.	12½
Fort Mackinac, Mich.	do.	do.	13½	do.	13½
Do.	Peter McNally	June 7, 1872	13	do.	13
Benicia arsenal, Cal.	do.	do.	07½	do.	07½
Fort Stevens, Oreg.	Lt. J. C. Clifford	June 14, 1872	09½	do.	09½
Camp Halleck, Nev.	do.	do.	17	do.	17
Camp Bidwell, Cal.	Isaac Bergman	June 8, 1872	10½	do.	10½
Fort Bayard, N. Mex.	John M. Dorsey	May 31, 1872	11	do.	11
Do.	Peter Peterson	June 1, 1872	0897	do.	0897
Fort Craig, N. Mex.	A. K. Watts	June 4, 1872	0999	do.	0999
Fort Wingate, N. Mex.	M. V. B. Wardwell	do.	0999	do.	0999
Fort Marcy, N. Mex.	Probst & Kirchner	do.	08½	do.	08½
Fort Union, N. Mex.	do.	do.	07½	do.	07½
Do.	W. B. Tipton	do.	0923	do.	0923
Fort Stanton, N. Mex.	do.	do.	0993	do.	0993
Fort McRae, N. Mex.	M. V. B. Wardwell	do.	0956	do.	0956
Camp Colyer, N. Mex.	do.	do.	10½	do.	10½
Fort Barrancas, Fla.	James Murphy	June 21, 1872		do.	

Statement of contracts made in the Subsistence Department during the fiscal year ended June 30, 1872—Continued.

Station.	By whom made.	Contractor.	Date.	Commencing.	Ending.	Article.	Price.	Remarks.
Fort Wood, N. Y.	Maj. W. W. Burns.	J. M. Evans.	June 26, 1872	July 1, 1872	Dec. 31, 1872	Fresh beef.	\$0 1520	In quarters.
Fort Warren, Mass.	do.	Andrew Pratt	do.	do.	do.	do.	13½	Do.
Do.	do.	do.	do.	do.	do.	Corned beef	10	Do.
Fort Independence, Mass.	do.	do.	do.	do.	do.	Fresh beef	13½	Do.
Do.	do.	do.	do.	do.	do.	Corned beef	10	Do.
Fort Warren, Mass.	do.	do.	do.	do.	do.	Fresh beef	30	Sales.
Fort Independence, Mass.	do.	do.	do.	do.	do.	do.	30	Do.
Fort Wood, N. Y.	do.	do.	do.	do.	do.	do.	22	Do.
Portland, Oreg.	Capt. W. H. Bell	J. M. Evans.	June 10, 1872	do.	June 30, 1873	do.	12½	In quarters.
Fort Vancouver, Wash.	do.	Isaac Bergman	do.	do.	do.	do.	1174	Do.
Camp Harney, Oreg.	do.	C. R. Stegert.	do.	do.	do.	do.	0690	Do.
Camp Warner, Oreg.	do.	Teal & Goldsmith.	June 6, 1872	Sept 1, 1872	Oct. 15 1872	Beef cattle	0697	Do.
Cape Disappointment, Wash.	do.	do.	do.	do.	do.	do.	12	Do.
Camp Wright, Cal.	Lt. James Halloran	Hobson & Warren	June 11, 1872	July 1, 1872	June 30, 1873	Fresh beef	10½	Do.
		Chas. Burne	June 14, 1872	do.	do.	do.	Per pound coin.	Do.
Camp Independence, Cal.	Lt. W. E. Dove	John Broder	June 20, 1872	do.	do.	do.	14½	Do.
Baton Rouge, La.	Lt. J. G. Leece	John Trosher	June 29, 1872	do.	do.	do.	09	Do.
Fort Shaw, Mont.	Capt. J. H. Gilman	N. Ford	June 6, 1872	do.	do.	do.	10½	Do.
Fort Ellis, Mont.	do.	do.	do.	do.	do.	do.	11½	Do.
Fort Buford, Dak.	do.	Jos. Anderson	May 8, 1872	May 8, 1872	Oct. 15, 1872	Beef cattle	0404	Do.
Fort Wadsworth, Dak.	do.	T. W. Baldwin	May 20, 1872	July 1, 1872	June 30, 1873	Fresh beef	14	Do.
Fort Snelling, Minn.	do.	C. Haas	do.	do.	do.	do.	07	Do.
Fort Ripley, Minn.	do.	Alfred Turner	do.	do.	do.	do.	13½	Do.
							13	In quantities of 500 pounds or over.
Fort Abercrombie, Dak.	do.	A. Turner	do.	do.	do.	do.	18	In quantities less than 500 pounds.
Fort Totten, Dak.	do.	Jos. Anderson	May 24, 1872	do.	do.	do.	1140	In quarters
Fort Pembina, Dak.	do.	H. Poehler	May 20, 1872	do.	do.	do.	1050	Do.
Fort Porter, N. Y.	Capt. J. P. Hawkins	P. Burgard	June 14, 1872	do.	Dec. 31, 1872	do.	10	Do.
Watertown arsenal, Mass.	Lt. O. E. Michaelis	E. D. Jones	June 24, 1872	do.	do.	do.	15	Do.
Willet's Point, N. Y.	Lt. C. E. L. B. Davis	Jacob Varian	June 27, 1872	do.	do.	do.	1074	Do.
Fort Brady, Mich.	Capt. J. P. Hawkins	P. S. Church	June 22, 1872	Aug. 1, 1872	June 30, 1873	do.	16	Do.
Fort Stockton, Tex.	Capt. S. T. Cushing	P. Gallagher	May 3, 1872	July 1, 1872	do.	Mutton	15	Sales.
Fort Davis, Tex.	do.	Ross Kennedy	do.	do.	do.	Fresh beef	06½	In quarters.
Fort McIntosh, Tex.	do.	Ochse & Rodrigue	do.	do.	do.	do.	06	Do.
Fort Stockton, Tex.	do.	Ross Kennedy	do.	do.	do.	do.	05	Do.
Fort Preble, Me.	Maj. W. W. Burns	Howell & Morse	June 29, 1872	do.	Dec. 31, 1872	do.	15	Do.
Do.	do.	do.	do.	do.	do.	do.	26	Sales.
Washington, D. C.	Maj. Geo. Bell	J. T. Varnell	do.	do.	June 30, 1873	do.	15	Do.
Do.	do.	do.	do.	do.	do.	do.	14	In quarters.
Do.	do.	do.	do.	do.	do.	Corned beef	10	Do.
Do.	do.	do.	do.	do.	do.	Fresh beef and mutton.	15	Sales.
Omaha Barracks, Nebr.	Capt. J. W. Barriger	Ballou & Cook	June 20, 1872	do.	do.	Fresh beef	08½	In quarters.

Statement of contracts made in the Subsistence Department during the fiscal year ended June 30, 1872—Continued.

Station.	By whom made.	Contractor.	Date.	Commencing.	Ending.	Article.	Price.	Remarks.
Austin, Tex.	Capt. S. T. Cushing.	Jos. Luckinger	May 3, 1872	July 1, 1872	June 30, 1873	Beef cattle.	\$0 06	Per pound.
Fort Griffin, Tex.	do	J. O. B. Street	do	do	do	do	04	do
Do	do	do	do	do	do	Fresh beef.	03 1-5	In quarters.
Fort Richardson, Tex.	do	do	do	do	do	do	04 1-5	Do.
Do	do	do	do	do	do	Beef cattle.	63 3-5	do
Fort Davis, Tex.	do	W. Hagelsieb	do	do	do	Fresh beef, mut-	08 1-5	do
						ton, and sheep.		
Fort Selden, N. Mex.	Capt. W. H. Nash	A. Lea	June 4, 1872	do	do	Fresh beef.	10	Do.
Fort Cummings, N. Mex.	do	S. J. Lyons	do	do	do	do	14	Do.
Do	do	do	do	do	do	Beef cattle.	12	Per pound,
North Platte, Nebr.	Capt. J. W. Barriger	Jas. W. Miller	June 12, 1872	Sept. 1, 1872	do	do	06 40	net.
Camp Douglas, Utah.	do	Chas. Popper	do	do	do	Fresh beef and		Per pound.
Do	do	do	do	do	do	beef cattle.	09 1-5	Do.
Camp Stambaugh, Wyo.	do	Frank Ecoffey	do	do	do	Beef cattle.	09 50	do
Camp Brown, Wyo.	do	do	do	do	do	Fresh beef and	14 1-5	beef cattle.
Fort Bridger, Wyo.	do	R. H. Hamilton	do	do	do	do	13	do
Cheyenne Depot, Wyo.	do	J. W. Iliff	do	do	do	do	15	do
Fort D. A. Russell, Wyo.	do	do	do	do	do	Fresh beef.	07 95	Do.
Fort Laramie, Wyo.	do	do	do	do	do	do	07 95	Do.
Fort Fetterman, Wyo.	do	do	do	do	do	do	07 95	Do.
Fort Fred. Steele, Wyo.	do	do	do	do	do	do	07 95	Do.
Sidney Barracks, Nebr.	do	do	do	do	do	do	07 95	Do.
Fort McPherson, Nebr.	do	A. C. Jester	do	do	do	do	06 50	Do.
Camp near Beaver City, Utah.	do	H. Semkins	do	July 1, 1872	do	do	11 42	Do.
Cheyenne Depot, Wyo.	do	J. W. Iliff	do	Sept. 1, 1872	do	Beef cattle.	06 1-5	do
Fort D. A. Russell, Wyo.	do	do	do	do	do	do	06 1-5	do
Fort Laramie, Wyo.	do	do	do	do	do	do	06 1-5	do
Fort Fetterman, Wyo.	do	do	do	do	do	do	06 1-5	do
Fort Fred. Steele, Wyo.	do	do	do	do	do	do	06 1-5	do
Sidney Barracks, Nebr.	do	do	do	do	do	do	06 1-5	do
Fort McPherson, Nebr.	do	A. C. Jester	do	do	do	do	06 1-5	do
Fort Concho, Tex.	Capt. S. T. Cushing	R. F. Tankersly	Apr. 26, 1872	July 1, 1872	do	Fresh beef.	03 1-5	Do.
Do	do	do	do	do	do	Beef cattle.	02 1-5	do
Fort Quitman, Tex.	do	John Kennedy	June 29, 1872	do	do	Fresh beef.	13 1-5	Do.
Do	do	do	do	do	do	Beef cattle.	06 1-5	do
Fort Brown, Tex.	do	John McAllen	May 3, 1872	do	do	Fresh beef.	05	Do.
Fort Selden, N. Mex.	Capt. W. H. Nash	Probst & Kirchner	July 5, 1871	Sept. 1, 1871	do	do	09 73	Do.
New York City	Lt. A. W. Hoffman	Jos. Elevation	July 1, 1871	July 1, 1871	do	Rations, complete.	50	Per ration
Memphis, Tenn.	Lt. J. D. Myrick	John Green	do	do	do	do	42 87	do
Do	Capt. F. M. Cox	do	July 13, 1871	July 13, 1871	do	do	42 87	do
Nashville, Tenn.	Capt. J. C. Gilmore	W. Sumner	July 21, 1871	July 21, 1871	Dec. 31, 1871	do	40	do

Indianapolis, Ind	Lt. H. S. Howe	J. G. Collins	Aug. 1, 1871	Aug. 1, 1871	Jan. 31, 1872	do.	50
Pittsburgh, Pa	Lt. J. M. Bell	Mrs. C. Strickland	do.	do.	June 30, 1872	do.	40
Boston, Mass	Lt. C. E. Nesmith	C. L. Stinkrauss	Aug. 23, 1871	Aug. 23, 1871	do.	do.	50
Detroit, Mich	Lt. J. Hale	John Lynch	Sept. 1, 1871	Sept. 1, 1871	do.	do.	48
New York City	Capt. E. V. Sumner	F. V. Groot	Aug. 16, 1871	Aug. 17, 1871	Oct. 10, 1871	do.	50
Louisville, Ky	Lt. E. W. Ward	Geo. Duell	do.	do.	Dec. 31, 1871	do.	50
Saint Louis, Mo	Capt. J. P. Brown	M. Hehrlein	Sept. 9, 1871	Oct. 1, 1871	June 30, 1872	do.	45
Springfield, Ill	Lt. O. A. Thompson	Jos. Kinz	Aug. 21, 1871	Sept. 1, 1871	Dec. 31, 1871	do.	47
Memphis, Tenn	Lt. J. D. Myrick	F. J. Washington	Oct. 11, 1871	Oct. 11, 1871	June 30, 1872	do.	4287
Milwaukee, Wis	Lt. G. F. Towle	G. B. Weinheimer	Oct. 1, 1871	Oct. 1, 1871	Feb. 31, 1872	do.	40
Do	Lt. Oscar Elting	do	do.	do.	Apr. 1, 1872	do.	40
Boston, Mass	Capt. Jos. Bush	G. A. Lans	Oct. 22, 1871	Oct. 22, 1871	Apr. 22, 1872	do.	50
Toledo, Ohio	Lt. Thos. Britton	Sellers & McAulley	July 26, 1871	July 26, 1871	Jan. 26, 1872	do.	40
Baltimore, Md	Lt. Thos. Latchford	Lousi Klegel	Oct. 25, 1871	Nov. 1, 1871	Apr. 30, 1872	do.	50
Chicago, Ill	Capt. S. B. M. Young	Chas. Raggio	Oct. 20, 1871	Oct. 20, 1871	June 30, 1872	do.	50
Brooklyn, N. Y	Capt. E. V. Sumner	Mrs. E. Miller	do.	do.	May 1, 1872	do.	50
Jersey City, N. J	do	Mary A. Van Doren	Nov. 6, 1871	Nov. 6, 1871	do.	do.	50
Albany, N. Y	Lt. Oscar Elting	Wm. Lane	Nov. 4, 1871	Nov. 4, 1871	do.	do.	45
Saint Louis, Mo	Lt. P. D. Vroom	M. Hehrlein	Dec. 9, 1871	Jan. 1, 1872	June 30, 1872	do.	45
Buffalo, N. Y	Lt. G. R. Griffith	John Gavin	Dec. 11, 1871	Dec. 11, 1871	do.	do.	50
Lexington, Ky	Lt. R. G. Smither	G. W. Spears	Dec. 6, 1871	Dec. 1, 1871	do.	do.	40
Do	do	Fred. Guggenberg	Dec. 8, 1871	do.	do.	do.	40
Philadelphia, Pa	Capt. E. B. Beaumont	M. Cavanaugh	Dec. 1, 1871	do.	do.	do.	40
Sacramento, Cal	Capt. P. M. Collins	W. Land	Jan. 1, 1872	Jan. 1, 1872	do.	do.	60
Willets Point	Capt. S. M. Mansfield	F. Duprat	Dec. 18, 1871	Dec. 18, 1871	do.	do.	40
New York City	Lt. A. W. Hoffman	C. D. Ficken	Dec. 11, 1871	Dec. 11, 1871	do.	do.	50
Oshkosh, Wis	Capt. Clayton Hale	A. Derber	Dec. 7, 1871	Jan. 1, 1871	do.	do.	39
Erie, Pa	Lt. J. T. Peale	W. L. Kelly	Dec. 14, 1871	Dec. 14, 1871	do.	do.	45
Rochester, N. Y	Lt. A. G. Force	Henry Pardee	Dec. 15, 1871	Dec. 15, 1871	do.	do.	50
Syracuse, N. Y	do	Caroline Kaiser	do.	do.	do.	do.	50
Buffalo, N. Y	do	John Gavin	Dec. 16, 1871	Dec. 16, 1871	do.	do.	50
Troy, N. Y	Lt. Oscar Elting	R. M. Carpenter	Dec. 11, 1871	Dec. 11, 1871	do.	do.	45
Detroit, Mich	Lt. C. F. Powell	Louis Quinlin	Jan. 3, 1872	Jan. 3, 1872	May 31, 1872	do.	48
Cleveland, Ohio	Lt. C. A. Coolidge	M. Niederst	Dec. 1, 1871	Dec. 1, 1871	June 30, 1872	do.	45
Indianapolis, Ind	Lt. H. S. Howe	J. G. Collins	Jan. 17, 1872	Feb. 1, 1872	do.	do.	50
Louisville, Ky	Lt. E. W. Ward	Geo. Duell	Jan. 1, 1872	Jan. 1, 1872	do.	do.	50
Wilkesbarre, Pa	Capt. E. B. Beaumont	Martin Bam	Jan. 16, 1872	Jan. 16, 1872	do.	do.	40
Albany, N. Y	Lt. Sam'l McConihe	M. Harber	Jan. 24, 1872	Jan. 24, 1872	do.	do.	45
Louisville, Ky	Lt. R. McDonald	Geo. Duell	Jan. 1, 1872	Jan. 1, 1872	do.	do.	50
Cincinnati, Ohio	Capt. W. Lyster	H. Picket	Jan. 22, 1872	do.	do.	do.	40
Troy, N. Y	Lt. Sam'l McConihe	E. Ball	Jan. 24, 1872	Jan. 24, 1872	do.	do.	50
Harrisburgh, Pa	Lt. James M. Bell	S. Hare	Jan. 1, 1872	Jan. 1, 1872	do.	do.	40
Cincinnati, Ohio	Lt. M. Moylan	F. Helles	Jan. 9, 1872	Jan. 19, 1872	do.	do.	40
Paducab, Ky	Capt. Geo. Purington	John Blerch	Jan. 25, 1872	Jan. 25, 1872	do.	do.	428
Chicago, Ill	Lt. G. J. Madden	A. Hendrich	Feb. 12, 1872	Feb. 12, 1872	do.	do.	50
Springfield, Ill	Lt. O. A. Thompson	John Kinz	Feb. 1, 1872	Feb. 1, 1872	do.	do.	47
Jersey City, N. J	Lt. W. E. Dougherty	B. Delaney	Feb. 28, 1872	Feb. 28, 1872	do.	do.	50
Brooklyn, N. Y	Lt. Chas. Keller	Mary A. Roe	Feb. 1, 1872	Feb. 1, 1872	do.	do.	50
Do	do	D. Lewis	do.	do.	do.	do.	50
Cleveland, Ohio	Lt. J. T. Peale	H. L. Clark	Feb. 29, 1872	Mch. 1, 1872	do.	do.	45
New York City	Capt. Chas. Wikoff	L. Maich	Mch. 5, 1872	Apr. 1, 1872	do.	do.	50
Elmira, N. Y	Capt. W. T. Kellogg	J. T. Winslow	Mch. 14, 1872	Mch. 1, 1872	do.	do.	50

Statement of contracts made in the Subsistence Department during the fiscal year ended June 30, 1872—Continued.

Station.	By whom made.	Contractor.	Date.	Commencing.	Ending.	Article.	Price.	Remarks.
Evansville, Ind.	Lt. G. L. Luhn	Fred'k Bohn	Apr. 1, 1872	Apr. 1, 1872	June 30, 1872	Rations, complete.	\$0 50	Per ration
Providence, R. I.	Lt. G. T. Towle	Hopkins & Sears	Apr. 17, 1872	Apr. 16, 1872	do	do	50	do
Baltimore, Md.	Lt. Thos. Latchford	A. H. Delort	Apr. 24, 1872	May 1, 1872	do	do	50	do
Boston, Mass.	Capt. Jos. Bush	G. A. Lans	Apr. 23, 1872	Apr. 23, 1872	do	do	50	do
Dubuque, Iowa	Lt. Geo. McDermott	Frank Hosh	Apr. 16, 1872	Apr. 16, 1872	do	do	47½	do
Cleveland, Ohio	Lt. C. A. Coolidge	Fred'k Knap	May 1, 1872	May 1, 1872	do	do	41	do
Philadelphia, Pa.	Lt. D. T. Wells	John Wildemeyer	May 9, 1872	May 9, 1872	do	do	40	do
Parkersburgh, W. Va.	Capt. G. A. Purington	S. J. Langfitt	May 10, 1872	May 10, 1872	do	do	4287	do
New York City	Lt. A. W. Hoffman	C. Hartigan	June 11, 1872	July 1, 1872	June 30, 1873	do	50	do
Do.	do	C. D. Ficken	do	do	do	do	50	do
Do.	do	Jos. Slevin	do	do	do	do	50	do
Detroit, Mich.	Lt. C. F. Powell	John W. Willis	June 7, 1872	June 17, 1872	Nov. 30, 1872	do	17	do
Indianapolis, Ind.	Lt. H. S. Howe	J. G. Collins	June 10, 1872	July 1, 1872	June 30, 1873	do	50	do
Saint Louis, Mo.	Capt. J. P. Brown	M. Hehrlein	June 5, 1872	do	do	do	45	do
New York City	Capt. C. A. Wikoff	L. Marsch	June 14, 1872	do	do	do	50	do
Do.	do	Geo. Burgard	do	do	do	do	50	do
Saint Louis, Mo.	Lt. P. D. Vroom	M. Mielk	June 6, 1872	do	do	do	45	do
Buffalo, N. Y.	Lt. G. R. Griffith	John Gavin	June 13, 1872	do	do	do	50	do
Cincinnati, Ohio	Lt. M. Moylan	Fred'k Helbes	do	do	do	do	40	do
Baltimore, Md.	Lt. Thos. Latchford	A. H. Delort	June 17, 1872	do	do	do	50	do
Cincinnati, Ohio	Capt. F. E. De Courcy	Henry Pickett	June 20, 1872	do	do	do	40	do
Jersey City, N. J.	Lt. W. E. Dougherty	D. E. Sullivan	do	do	do	do	50	do
Chicago, Ill.	Lt. G. J. Madden	A. Hendrick	June 26, 1872	do	do	do	50	do
Springfield, Ill.	Lt. O. A. Thompson	J. S. King	June 28, 1872	July 11, 1872	do	do	47	do
Camp Hualpai, Ariz.	Lt. Col. M. D. L. Simpson	N. Richard	July 7, 1871	July 7, 1871	June 30, 1872	Flour	11	Per pound
Camp Date Creek, Ariz.	do	do	do	do	do	do	10½	do
Camp Verdi, Ariz.	do	do	do	do	do	do	11	do
Fort Whipple, Ariz.	do	do	do	do	do	do	12	do
Camp Warner, Oreg.	Capt. W. H. Bell	M. S. Hellman	July 5, 1871	July 1, 1871	Nov. 30, 1871	do	0547	do
Camp Harney, Oreg.	do	do	do	do	do	do	0547	do
Rock Island arsenal, Ill.	Lt. M. L. Poland	Partner & Don	Aug. 1, 1871	Aug. 1, 1871	Jan. 31, 1872	Flour and soft bread.	03½	do
Fort Lapwai, Idaho.	Capt. W. H. Bell	Pine Bros. & Moore	July 6, 1871	July 6, 1871	Oct. 31, 1871	Flour	033-5	do
Fort Colville, Wash.	do	W. Oppenheimer & Co	do	do	Nov. 30, 1871	do	0498½	do
Fort Boise, Idaho.	do	H. P. Isaacs	do	do	Sept. 30, 1871	do	04½	do
Camp Bidwell, Cal.	Capt. R. F. Bernard	Irwin Ayres	Sept. 1, 1871	Sept. 1, 1871	June 30, 1872	do	65	Per pound, coin.
San Antonio, Tex.	Capt. S. T. Cushing	S. Menger	Nov. 8, 1871	Jan. 1, 1872	do	Soap	10	Per pound.
Camp McDowell, Ariz.	Capt. I. G. C. Lee	N. Richard	Sept. 6, 1871	Sept. 6, 1871	do	Flour	0715	do
Camp Grant, Ariz.	do	do	do	do	do	do	0635	do
Camp Apache, Ariz.	do	T. F. Harwood	do	do	do	do	091	do
Camp Bowie, Ariz.	do	S. Blum	do	do	do	do	0695	do
Camp McDowell, Ariz.	do	W. B. Hellings	do	do	do	Beans	08	do
Fort Whipple, Ariz.	do	do	do	do	do	do	10	do

List of contracts made by the Engineer Department and received at the office of the Chief of Engineers during the year 1872, required by the fifth section of the act of April 21, 1808, chapter 48, to be annually reported to Congress, together with those made in 1871 not heretofore reported.

Contractors.	Date.	Objects and terms of contracts.
Leverich & Gardiner, with Major John M. Wilson, Corps of Engineers.	Nov. 6, 1871	For furnishing Canada white-pine timber and plank for the improvement of Oswego Harbor, New York, at \$23 per 1,000 feet, board-measure. Contract expired June 20, 1872, and under extension August 1, 1872.
John M. Foote, with Major W. P. Craighill, Corps of Engineers.	Jan. 5, 1872	For furnishing machinery and appliances and removing rocks from the bed of the Roanoke River, North Carolina, at \$11.45 per cubic yard. Contract expired January 1, 1873.
Albert Blaisdell, with Major Walter McFarland, Corps of Engineers.	Nov. 10, 1871	For furnishing all machinery and appliances and improving the Tennessee River between Kingston and Chattanooga, at, for each snag or sunken log removed, \$10; each cubic yard of sand, gravel, or earth excavated, \$1; construction of riprap dams, per cubic yard, \$2.75; removal of solid rock, per cubic yard, \$4; removal of loose rock or bowlders, at, for each cubic yard, \$2.75; removal of locality. Contract expired under extension December 31, 1872.
Post & Henderson, with Major John M. Wilson, Corps of Engineers.	Feb. 14, 1872	For furnishing sawed Canada or Norway white-pine timber for improvement of Little Sodus Harbor, New York, at per cubic yard, \$2.75 and \$3.75, according to locality. Contract expired June 30, 1872.
Charles J. De Graw, with Major John M. Wilson, Corps of Engineers.	Feb. 19, 1872	For furnishing 148,200 feet, board-measure, of sawed, 12 inches square, hemlock timber, delivered and piled, for im-
James McLean, with Major John M. Wilson, Corps of Engineers.	Feb. 22, 1872	provement of Little Sodus Harbor, New York, at \$17.40 per 1,000 feet, board-measure. Contract expired under extension August 1, 1872.
T. A. McLaughlin, with Major O. E. Babcock, Corps of Engineers.	Mar. 13, 1872	For furnishing material and labor for improvement of the harbor of Charlotte, New York, at, for Canada or Norway white-pine timber, per 1,000 feet, board-measure, \$20; oak snubbing-posts, per 1,000 feet, board-measure, \$45; wrought-iron drift bolts and spikes, 5½ cents per pound; removing and placing 350 cords stone in the pier, per cord, \$1.42; performing all labor necessary for removing old timber and iron of present superstructure, and framing, joint-
Jacob Muddaman, with Major O. E. Babcock, Corps of Engineers.	Mar. 19, 1872	ing, bolting, spiking, putting in snubbing-posts, and completing an entire new superstructure on 800 feet more, at \$8 per 1,000 feet, board-measure, for the timber used in construction, and to include the labor of driving the iron.
Barker & Williams, with Major O. M. Poe, Corps of Engineers.	Apr. 15, 1872	Contract expired under extension November 1, 1872.
Barker, Williams & Bangs, with Major O. M. Poe, Corps of Engineers.	Apr. 15, 1872	For furnishing materials and labor and completing the central gate-house of the Washington Aqueduct, at 50 cents per cubic yard for earth excavation; \$8.75 for concrete; stone-masonry, \$14.90; brick-masonry, \$15; stone-coping, \$37.50; furnishing and setting Phenix-beams, per pound, 10 cents; iron bolts and nuts, 16 cents; cast-iron grooves, 11 cents; hauling and setting 48 inch gate, stand, pipe, and spindle, \$150.
Augustus R. Wright, with Lieutenant-Colonel George Thom, Corps of Engineers.	Apr. 23, 1872	For furnishing the stone and labor necessary for the full and final completion of the coping of the parapets of Cabin John Bridge, Washington Aqueduct, and constructing and completing the same, at \$1.75 per cubic foot of coping.
Joseph Paquet, with Major Henry M. Robert, Corps of Engineers.	May 1, 1872	For continuing the improvement of the Saint Mary's Falls Canal, Michigan, being an extension of the contract of the same parties, dated February 9, 1871, to July 1, 1873, upon the same terms and provisions.
Hemenway & Garfield, with Captain G. L. Gillespie, Corps of Engineers.	May 16, 1872	For improvement of the Saint Mary's Falls Canal, Michigan, being an extension of the contracts of October 20, 1870, and February 9, 1871, to July 1, 1873, upon the same terms and conditions as are therein provided.
E. H. French, with Major John M. Wilson, Corps of Engineers.	May 23, 1872	For dredging a channel through Gravel Point Bar, in Royals River, Maine, at 49 cents per cubic yard, and at \$10 per hour for the removal of logs or snags. Contract expired September 15, 1872.
W. B. Downing & Brother, with Major O. E. Babcock, Corps of Engineers.	June 6, 1872	For constructing wing-dams on the Willamette River, above Oregon City, Oregon, at \$2.50 per linear foot. Contract expired October 31, 1872.
		For furnishing labor and materials for extending the east and west piers of Grand River Harbor, Ohio, into Lake Erie, at, for pine timber and plank, per 1,000 feet, board-measure, \$21.95; white-oak piles, (driven,) 50 cents per linear foot; wrought iron screw-bolts, per pound, 8 cents; drift-bolts, 5½ cents; spikes, 6½ cents; boiler-iron plate, per pound, 10 cents; hard rubble-stone, per cord, \$8.95; dredging, per cubic yard, 50 cents; framing under water, per linear foot, 10 cents; framing above water, per linear foot, 9½ cents; laying joists and plank, per 1,000 feet, board-measure. Contract expired November 8, 1872.
		For dredging in the harbor of Oak Orchard, New York, at 75 cents per cubic yard, for 8,500 cubic yards. Contract expired June 10, 1872.
		For building an office in Georgetown, D. C., for use of the Washington Aqueduct, as per specifications, \$4,822. Contract expired September 21, 1872.

H. E. Ex. 158	Alfred N. Coon, with Major O. E. Babcock, Corps of Engineers.	June 28, 1872	For furnishing labor and materials for full completion of the auxiliary gate-house, the wooden fence at the distributing-reservoir, the wooden fence at the high-service reservoir, and the ventilators over the conduit of the Washington Aqueduct, at, for wooden fence for reservoirs, per linear foot, 72 cents, and at auxiliary gate-house, for cut-stone masonry, per cubic foot, \$2.50; brick masonry, per cubic foot, 45 cents; all the doors, with fixtures and fastenings, \$1,000; cast iron, per pound, 9 cents; wrought iron, per pound, 18 cents; iron spindle, set complete, \$100; sky-light ventilator, \$100; excavation for ventilators over conduit, per cubic yard, 50 cents; cut-stone masonry for same, per cubic foot, \$3; brick masonry, per cubic foot, 60 cents; cast iron, per pound, 9 cents. Contract expired October 1, 1872.
	Edward P. Doherty, with Major O. E. Babcock Corps of Engineers.	June 29, 1872	For doing the excavation necessary for the distributing-reservoir of the Washington Aqueduct, including the furnishing of tools, at 33 cents per cubic yard. Contract expired September 1, 1872.
158	D. E. Bailey, with Major F. Harwood, Corps of Engineers.	July 5, 1872	For furnishing, for improvement of Buffalo Harbor, New York, white-oak piles, at 25 cents per linear foot; sawed timber and lumber, at \$19.98 per 1,000 feet, board-measure; wrought-iron screw and washer bolts, at 4½ cents per pound; drift-bolt iron, in bars, 3½ cents per pound; wrought-iron spikes, 5½ cents per pound; driving piles, each, \$5; framing, cutting, cutting iron for bolts, bolting, fastening, and securing, by stay-piles, the cribs or other wood work under water in place, per running foot, 12 cents; same for superstructure above low-water stage, 12 cents; fitting and fastening the scantling and boards, gaining, boring and bolting, or spiking the joists and fitting, boring and spiking the planks, \$7 per 1,000 feet, board-measure; furnishing and putting into the work all rubble-stone in the cribs or superstructure, or other places, per cord, \$6.85. Contract expires June 30, 1873.
	Shehan & Loler, with Major G. Weitzel, Corps of Engineers.	July 6, 1872	For furnishing materials and labor, and constructing the retaining-walls of the Louisville and Portland Canal, and grading slopes of canal-bank, at, for earth excavation above upper guard-gates, 65 cents per cubic yard, and 40 cents below the same; for masonry, \$11.10 per cubic yard; for removing old pavement, \$1 per cubic yard, and for masonry, \$10.25 per cubic yard. Contract expired January 1, 1873.
	B. Mallefert, with Major Q. A. Gillmore, Corps of Engineers.	July 15, 1872	For removing wreck of monitor Patapsco, in Charleston Harbor, to a depth of 25 feet at mean low water, for proceeds of wreck. Contract expired October 1, 1872.
	R. A. Shinn & Co., with Major O. E. Babcock, Corps of Engineers.	July 29, 1872	For furnishing materials and labor necessary for the completion of the parapets of stone bridges on the Washington Aqueduct, at, for hauling, cutting, and setting stone-coping, per cubic foot, 88 cents. Contract expired December 1, 1872.
	Emmart, Smith & Co., with Major O. E. Babcock, Corps of Engineers.	July 31, 1872	For furnishing machinery, tools, and labor, and excavating the distributing-reservoir of the Washington Aqueduct, at 33½ cents per cubic yard for earth excavation. Contract expired December 1, 1872.
	Emmart, Smith & Co., with Major O. E. Babcock, Corps of Engineers.	July 31, 1872	For furnishing labor and appliances and laying a 48-inch iron pipe in the distributing-reservoir of the Washington Aqueduct, at 35½ cents per cubic yard for earth excavation, and 75 cents for rock; brick-masonry, in cement, \$19 per cubic yard; cutting cast-iron 48-inch pipes, each, \$10; gasketing, leading, and making 48-inch joints, each, \$18.25; furnishing and setting ¼-inch air-cocks, each, \$8; furnishing and setting wrought-iron bolts and bands, per pound, 20 cents; hauling and distributing castings, per ton of 2,000 pounds, \$3.50. Expiration of contract indefinite; contingent.
	Illinois Central Railroad Company, by John Newell, president, with Major D. C. Houston, Corps of Engineers.	Aug. 7, 1872	For constructing extension of breakwater at Chicago, Illinois, at, for pine timber, per linear foot, 34 7-10 cents; hemlock timber, per linear foot, 30 6-10 cents; oak timber, per 1,000 feet, board-measure, \$18; pine plank, \$16; white-oak piles, per linear foot, 25 cents; iron drift-bolts, 5½ cents per pound; iron screw-bolts, 8 cents per pound; iron spikes, 8 cents; stone, per cord, \$6.50; brush and slabs, \$4 per cord; framing, including labor of construction, placing, sinking, and filling cribs with stone; of timber used, per linear foot, 12½ cents; laying planking, including spiking, per 1,000 feet, board-measure, \$3; driving piles, each, 3.50.
	Fox & Howard, with Major D. C. Houston, Corps of Engineers.	Aug. 9, 1872	For furnishing labor and materials and constructing a pile-pier in the harbor of Michigan City, Indiana, at 35 cents per linear foot for pine timber, and \$25 per 1,000 feet, board-measure, for pine plank; 25 cents per linear foot for Norway pine piles; 8 cents per pound for iron drift-bolts, and 12 cents per pound for iron screw-bolts; 8½ cents per pound for spikes; \$15 per cord for stone and \$8 for brush; framing, bolting, and finishing in place pine timber, per linear foot, 15 cents; laying planking, including spiking, per 1,000 feet, board-measure, \$10; driving piles, per linear foot, 15 cents. Contract expires September 1, 1873.

List of contracts made by the Engineer Department and received at the office of the Chief of Engineers during the year 1872, &c.—Continued.

Contractors.	Date.	Objects and terms of contracts.
Sidney Adams, with Major D. C. Houston, Corps of Engineers.	Aug. 10, 1872	For furnishing material and labor and constructing and putting in place 300 feet of breakwater at Marquette Harbor, Michigan, at 30 cents per linear foot of pine and hemlock timber, 12 inches by 18 inches; 20 cents per linear foot for 12 inches square pine timber; \$35 per 1,000 feet, board-measure, for oak-timber; \$18 per 1,000 feet, board-measure, for pine plank; 6½ cents per pound for iron drift-bolts; 10 cents for screw-bolts and 7 cents for spikes; \$9 per cord for stone and brush, and \$7 for slabs; framing, including labor of constructing, placing, sinking, and filling cribs with stone, 13 cents per linear foot; laying plank, including spiking, \$3 per 1,000 feet, board-measure; driving piles, each, \$3. Contract expires September 1, 1873.
Joseph Rankin, with Major D. C. Houston, Corps of Engineers.	Aug. 10, 1872	For constructing and putting in place in the harbor of Two Rivers, Wisconsin, 500 feet of pile-pier at 16 cents per linear foot for 12-inches square pine timber; \$22 per 1,000 feet, board-measure, for oak timber; \$13 per 1,000 feet, board-measure, for pine plank; 12 cents per linear foot for rock elm piles; 6 cents per pound for iron drift-bolts; 9 cents for screw-bolts, and 6 cents for spikes; \$8 per cord for stone and \$2 for slabs; framing, including bolting and finishing in place pine timber, 16 cents per linear foot, and 30 cents for oak; laying plank, including spiking per 1,000 feet, board-measure, \$2; driving piles, per linear foot driven, 22 cents. Contract expires August 1, 1873.
Thomas Windiate, with Major D. C. Houston, Corps of Engineers.	Aug. 10, 1872	For constructing 100 feet, more or less, of pier-work in Cheboygan Harbor, Michigan, and dredging and removing 5,000 cubic yards, at 30 cents per linear foot for pine timber and 20 cents for hemlock; for oak timber and \$15 for pine plank; 20 cents for spikes; \$8 per cord for stone and \$3 for brush and slabs; framing, placing, and sinking and filling for 12-inches square pine and 20 cents for hemlock; \$24 per 1,000 feet, board-measure, for oak timber and \$15 for pine plank; 20 cents for spikes; \$8 per cord for stone and \$3 for brush and slabs; framing, placing, and sinking and filling cribs with stone, 15 cents per linear foot; laying plank, including spiking, \$2 per 1,000 feet; driving piles, each, \$3; dredging per cubic yard, 30 cents. Contract expires August 1, 1873.
Abner Kirby, with Major D. C. Houston, Corps of Engineers.	Aug. 10, 1872	For constructing and putting in place in Menomonee Harbor, Wisconsin and Michigan, 500 feet of pile-pier and 700 feet of slab-pier, at 17 cents per linear foot for 12-inches square pine timber; \$45 per 1,000 feet, board-measure, for oak timber; \$12.50 per 1,000 feet, board-measure, pine plank; 9 cents for Norway pine piles; 6 cents per pound for iron drift-bolts, 8½ cents for screw-bolts, and 7 cents for spikes; \$9 per cord for stone and \$2.50 for slabs; framing, bolting, and finishing in place pine timber, 17 cents per linear foot, and 40 cents for oak; laying plank and piling, per 1,000 feet, board-measure, \$8; driving piles, per linear foot 28 cents. Contract expires August 1, 1873.
Le May & Grant, with Major D. C. Houston, Corps of Engineers.	Aug. 10, 1872	For furnishing materials, labor, and appliances, and constructing and putting in place 750 feet of pier-work in Superior City Harbor, Wisconsin, at 36 cents per linear foot for 12-inch pine and hemlock timber; 14 cents per linear foot for 12-inches square pine and hemlock timber; \$40 per 1,000 feet for oak timber and \$14 for pine plank; 20 cents for 12-inches square pine and hemlock piles; 8 cents per pound for iron drift-bolts, 10 cents for screw-bolts, and 8½ cents for linear foot for white-oak piles; \$5.50 for brush and \$5 for slabs; framing, placing, filling cribs with stone, and spikes; \$7.50 per cord for stone; \$5.50 for brush and \$5 for slabs; framing, placing, filling cribs with stone, and sinking, per linear foot, 10 cents; laying and spiking planks, per 1,000 feet, board-measure, \$5; driving piles, each, \$2. Contract expired December 1, 1872.
F. M. Knapp, with Major D. C. Houston, Corps of Engineers.	Aug. 10, 1872	For constructing 50 feet of pier-work in the harbor of Kenosha, Wisconsin, at 32 cents per linear foot of pine and hemlock timber; 30 cents per 1,000 feet of oak timber; \$16 per 1,000 feet, board-measure, for pine plank; 25 cents per linear foot for white-oak piles; 6 cents per pound for iron drift-bolts, and 8 cents for screw-bolts and spikes; \$15 per cord for stone and \$5.50 per cord for brush and slabs; framing, placing, sinking, and filling cribs with stone, per linear foot for stone and \$5.50 per cord for brush and slabs; framing, placing, sinking, and filling cribs with stone, each, 18 cents; laying and spiking plank, \$2 per 1,000 feet, board-measure; driving piles, each, \$6. Contract expires December 1, 1872.
Thomas Windiate, with Major D. C. Houston, Corps of Engineers.	Aug. 12, 1872	For constructing 200 feet of pile-pier and dredging 35,000 cubic yards in the harbor of Ahnapee, Wisconsin, at 18 cents per linear foot for pine timber; \$24 per 1,000 feet, board-measure, for oak timber and \$15 for pine plank; 14 cents per linear foot for rock elm piles; 6 cents per pound for iron drift-bolts and spikes, and 9 cents for screw-bolts; \$6 per cord for stone and \$2.50 for slabs; framing, bolting, and finishing in place pine timber, 16 cents per linear foot and 30 cents for oak; laying and spiking plank per 1,000 feet, board-measure, \$2; driving piles, 25 cents per linear foot driven. Contract expires August 1, 1873.

S. F. Shelburne, with Major G. K. Warren, Corps of Engineers.	Aug. 12, 1872	For dredging in Bridgeport Harbor, Connecticut, at 21½ cents per cubic yard. Contract expires June 30, 1873.
Sydney F. Shelburne, with Major G. K. Warren, Corps of Engineers.	Aug. 12, 1872	For dredging in Huntington Harbor, New York, at 30 cents per cubic yard at the entrance, and at 14.95 cents per cubic yard inside the harbor. Contract expires June 30, 1873.
Morris & Cummings, with Major W. P. Craighill, Corps of Engineers.	Aug. 16, 1872	For furnishing machinery and appliances and dredging in Northeast River, Maryland, at 20 cents per cubic yard. Contract expired November 30, 1872.
Morris & Cummings, with Major W. P. Craighill, Corps of Engineers.	Aug. 16, 1872	For furnishing machinery and appliances and dredging a channel in Worton Creek, Maryland. Contract expires June 1, 1873.
John G. Sheffield, with Major G. K. Warren, Corps of Engineers.	Aug. 14, 1872	For delivering at Block Island, Rhode Island, about 10,000 tons blasted or quarried rock, (granite blocks,) at \$2.19 per ton. Contract expires June 30, 1873.
Staples & Phillips, with Major G. K. Warren, Corps of Engineers.	Aug. 15, 1872	For excavating a channel-way in the Taunton River, Massachusetts, at Burt's Rock and Pond Creek Shoals, and other places between Dighton and Weir Village, at \$3.45 per cubic yard. Contract expires June 30, 1873.
James S. Routh, with Major Wm. E. Merrill, Corps of Engineers.	Aug. 16, 1872	For constructing a dike in the Ohio River, near Evansville, at \$1.70 per cubic yard for stone; \$1.20 per cord for brush used; and \$10 each for piles. Contract expires December 1, 1873.
James S. Routh, with Major W. E. Merrill, Corps of Engineers.	Aug. 16, 1872	For furnishing and putting in place 1,500 cubic yards of stone for the repair of the dike at Glass House Ripple, in the Ohio River, at \$1.60 per cubic yard. Contract expired December 1, 1872.
Coll. P. McDougall, with Major D. C. Houston, Corps of Engineers.	Aug. 16, 1872	For constructing and putting in place in the harbor of Du Luth, Minnesota, 300 feet of breakwater, at 21 cents per linear foot for 12-inch pine and hemlock timber; 16 cents per linear foot for 12-inch pine and hemlock timber; \$16 per 1,000 feet, board-measure, for oak timber, and \$12 for pine plank; 9 cents per linear foot for white-oak plank; 6½ cents per pound for iron drift-bolts, and 7 cents for screw-bolts and spikes; \$6.29 per cord for stone, and \$3 for brush and slabs; framing, placing, sinking, and filling cribs with stone, 8 cents per linear foot; laying and spiking plank per 1,000 feet, board-measure, \$2; driving piles, each, \$1. Contract expires September 1, 1873.
Cornelius Daly, with Major John M. Wilson, Corps of Engineers.	Aug. 19, 1872	For dredging in the channel of the Saint Lawrence River, to a depth of 12 feet at lowest water, at \$1.25 and 37½ cents per cubic yard, according to locality. Contract expires July 1, 1873.
Henry J. Mowry, with Major John M. Wilson, Corps of Engineers.	Aug. 19, 1872	For furnishing materials and labor, preparing bottom, and building up upon the old cribs in Big Sodus Harbor, New York, 360 feet, more or less, of the east breakwater, at \$21 per 1,000 feet, board-measure, for hemlock timber and plank; 6 cents per pound for iron drift-bolts; 7 cents per pound for spikes; \$8 per cord for rubble-stone; \$9 per 1,000 feet, board-measure for labor on timber, and 2 cents per pound for labor on iron. Contract expires July 1, 1873.
A. R. Wright, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 20, 1872	For dredging a channel through the bar at the head of Swan Island Bar, Kennebec River, Maine, to a depth of 10 feet at mean low water, at 50 cents per cubic yard, or \$100 per day of eight hours. Contract expired October 1, 1872.
Andrew A. Bonker, with Major G. K. Warren, Corps of Engineers.	Aug. 20, 1872	For constructing at Drew's Rock, Housatonic River, Connecticut, an embankment of blasted or quarried stone, at \$1.70 per cubic yard. Contract expires June 30, 1873.
G. H. Ferris, with Major G. K. Warren, Corps of Engineers.	Aug. 21, 1872	For dredging in the Norwalk River, Connecticut, opposite Jennings' Wharf, and above and below the same, at 24½ cents per cubic yard. Contract expires June 30, 1873.
George H. Ferris, with Major W. P. Craighill, Corps of Engineers.	Aug. 21, 1872	For dredging in the Craighill Channel, Baltimore Harbor, (Patapsco River,) at 29 cents per cubic yard. Contract expires November 15, 1873.
George H. Ferris, with Major W. P. Craighill, Corps of Engineers.	Aug. 21, 1872	For dredging in the harbor of Cambridge, Maryland, at 18½ cents per cubic yard. Contract expires April 15, 1873.
Bird & Mickle, with Captain S. M. Mansfield, Corps of Engineers.	Aug. 21, 1872	For constructing, filling with stone, and putting in place an extension of 65 feet of crib-work to the south pier in the harbor of Frankfort, Michigan, furnishing all the material except 32-inch drift-bolts, and all the labor, machinery, and appliances, at 26 cents per cubic foot hemlock timber and 30 cents for pine; \$14 per cord for stone; 6½ cents per pound for iron drift-bolts, and \$2 per cord for slabs. Contract expires June 1, 1873.
Bird & Mickle, with Captain S. M. Mansfield, Corps of Engineers.	Aug. 21, 1872	For furnishing all the materials except such iron and pine timber as may be delivered to him, all labor, machinery, and appliances, and making such repairs and constructing such pile pier as is required in the harbor of Muskegon, Michigan, at 18 cents per cubic foot; 14 cents per cubic foot for framing, bolting, and putting in place pine timber; furnishing oak timber 10 inches by 12 inches, 36 cents per linear foot, and 26 cents for 4 inches by 8 inches; 8 cents for Norway pine-piles per linear foot; 7 cents per pound for wrought-iron drift-bolts; screw bolts and washers, 7½ cents; \$14 per cord for stone; 21 cents per linear foot for driving piles; 30 cents per cord for either removing slabs from old piers, or for removing slabs from old slab-piers into new work. Contract expires August 1, 1873.

List of contracts made by the Engineer Department and received at the office of the Chief of Engineers during the year 1872, &c.—Continued.

Contractors.	Date.	Objects and terms of contracts.
Bird & Mickle, with Captain S. M. Mansfield, Corps of Engineers	Aug. 21, 1872	For delivering such Norway pine piles as are required, and furnishing all materials and labor, machinery, &c., and constructing a pile revetment, except the work of driving the piles, in the harbor of Manistee, Michigan, at 32 cents per cubic yard for 12 inches by 12 inches pine timber per linear foot; 36 cents for 10 inches by 12 inches oak and 26 cents for 4 inches by 8 inches oak; 7 cents per pound for iron drift-bolts and 7½ cents for screw-bolts and washers; \$12.50 per cord for stone and \$2 per cord for slabs. Contract expires July 1, 1873.
D. V. Howell, with Major G. K. Warren, Corps of Engineers.	Aug. 21, 1872	For delivering about 8,000 tons of granite riprap stone in the jetty at Bridgeport Harbor, Connecticut, at \$2.37 per ton. Contract expires June 30, 1873.
M. F. Brainard, for Albany Dredging Company, with Major W. P. Craighill, Corps of Engineers.	Aug. 22, 1872	For dredging in the south channel of the Appomattox River, Virginia, near the city of Petersburg, at 16.45 cubic yard. Contract expires February 15, 1873.
Soule & Brown, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 22, 1872	For delivering 5,000 tons, more or less, of rough shore stone, or black stone, for foundation of breakwater extension in Portland Harbor, Maine, at \$1.20 per ton. Contract expired November 1, 1872.
M. F. Brainard, for Albany Dredging Company, with Major W. P. Craighill, Corps of Engineers.	Aug. 22, 1872	For dredging in Queenstown Harbor, Maryland, at 19½ cents per cubic yard. Contract expired November, 1 1872.
M. F. Brainard, with Major G. K. Warren, Corps of Engineers.	Aug. 22, 1872	For dredging in Wareham Harbor, Massachusetts, at 34½ cents per cubic yard, measured in the scows. Contract expires June 30, 1873.
Edgar M. Payn, with Major G. K. Warren, Corps of Engineers.	Aug. 22, 1872	For dredging in the Pawtucket River, Rhode Island, below the city of Pawtucket, at 32½ cents per cubic yard. Contract expires June 30, 1873.
Edgar M. Payn, with Major G. K. Warren, Corps of Engineers.	Aug. 22, 1872	For dredging in the Pawcatuck River, Rhode Island and Connecticut, from Cemetery Point up the river toward Westerly, at 36½ cents per cubic yard. Contract expires June 30, 1872.
E. R. Seward, with Major G. K. Warren, Corps of Engineers.	Aug. 22, 1872	For dredging in the Thames River, Connecticut, below Norwich, at 19 cents per cubic yard. Contract expires June 30, 1873.
S. F. Shortland & Brother, with Major G. K. Warren, Corps of Engineers.	Aug. 22, 1872	For excavating in New Haven Harbor, Connecticut, so as to make a cut across the sand-bar opposite Fort Hale, increasing the depth from 13 to 15 feet at mean low water, at 19.73 cents per cubic yard. Contract expires June 30, 1873.
M. F. Brainard, with Major G. K. Warren, Corps of Engineers.	Aug. 22, 1872	For excavating in the Connecticut River, Connecticut, at Pratt's Ferry Bar, and at such other points as may be agreed upon, at 25 cents per cubic yard. Contract expires June 30, 1873.
M. F. Brainard, with Major G. K. Warren, Corps of Engineers.	Aug. 22, 1872	For excavating in the Peconic River, Long Island, New York, at 24 cents per cubic yard, measured in the scows. Contract expires June 30, 1873.
Edward Moore, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 22, 1872	For furnishing for the breakwater at Richmond's Island, Maine, 15,000 tons of large and small stone, at \$1.24 per ton. Contract expires January 13, 1873.
Samuel Dyer, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 23, 1872	For removing rocks in Welfleet Harbor, Maine, at \$250 for Channel Rock, \$750 for Lobster Rock, \$400 for Lump-fish Rock, \$450 for Mayo's Rock, and \$550 for Bay Rock. Contract expires June 30, 1873.
Lord & Wright, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 23, 1872	For building the outer pier and capping required for the completion of the breakwater in Portland Harbor, Maine, at \$9,750 for the outer pier and \$22.50 per linear foot for the granite capping. Contract expires June 30, 1873.
Albert A. Dodge, with Major W. P. Craighill, Corps of Engineers.	Aug. 23, 1872	For furnishing machinery and appliances and dredging in the Rappahannock River, Virginia, at 33 cents per cubic yard. Contract expired January 1, 1873.
James Andrews, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 23, 1872	For building 275 linear feet of sea-wall on Long Island Head, Boston Harbor, including excavation, back filling, and paving, at \$58.19 per running foot for granite wall, including facing and coping, concrete, foundation, and backing; \$10.25 per cubic yard for concrete for additional foundation; \$1 per cubic yard for excavation; 50 cents per cubic yard for back filling and \$5 per superficial yard for paving. Contract expired November 30, 1872.
H. J. Mowry, with Major John M. Wilson, Corps of Engineers.	Aug. 23, 1872	For constructing 190 feet of pier at Little Sodus Harbor, New York, at \$24 per 1,000 feet, board-measure, for hemlock timber and plank; \$32 for Norway white pine and plank; 50 cents per linear foot for white-oak snubbing-posts; 8 cents per pound for iron screw and washer bolts, 6 cents for drift-bolts, and 7 cents for spikes; \$8 per cord for rubble-stone; \$1 per cubic yard for dredging; \$7 per 1,000 feet, board-measure, for labor on timber, and 1 cent per pound for labor on iron. Contract expires July 1, 1873.

H. J. Mowry, with Major John M. Wilson, Corps of Engineers.	Aug. 23, 1872	For constructing 210 feet of pier at Olcott, New York, at \$23 per 1,000 feet, board-measure, for hemlock timber and plank; \$28 for Norway or Canada white-pine timber; 50 cents per linear foot for white-oak snubbing-posts; 8 cents per pound for wrought washers and spikes; \$8 per cord for rubble-stone; \$7 per 1,000 feet for labor on timber and 2 cents per pound on iron, and 10 cents each for trenails driven. Contract expires July 1, 1873.
J. H. Teemyer & Co., with Major W. P. Craighill, Corps of Engineers.	Aug. 4, 1872	For dredging in the Wilcomico River, 14,000 cubic yards, at 28 cents per cubic yard. Contract expired November 1, 1872.
James M. Andrews, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 24, 1872	For building a sea-wall of 225 feet on Point Allerton, Boston Harbor, in extension of that already done, at \$77.90 per running foot of granite wall; \$11 per cubic yard of concrete; \$1 per cubic yard of excavation; 50 cents per cubic yard of back filling and \$6.40 per superficial yard of paving. Contract expired November 30, 1872.
Miller & Bedard, with Major W. E. Merrill, Corps of Engineers.	Aug. 26, 1872	For furnishing necessary material and repairing dam at head of Cumberland Island, in the Ohio River, at \$1.23 per cubic yard for stone used. Contract expired December 1, 1872.
Miller & Bedard, with Major W. E. Merrill, Corps of Engineers.	Aug. 26, 1872	For removing that portion of Bacon Rock which is within 7 feet of the surface of the water when it stands at zero by gauge at Cairo, Illinois, for \$4,843. Contract expires February 1, 1873, (conditional.)
George W. Townsend, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 26, 1872	For blasting and removing to a depth of 7 feet below mean low water in Penobscot River, Maine, Independence Rock, at \$7,440; Steamboat Ledge, at \$6,000; and ledge off Dole's planing-mill, at \$7,760. Contract expires August 30, 1873.
George W. Townsend, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 26, 1872	For removing rocks in Gloucester Harbor, Massachusetts, at \$450 for Glam Rock; \$1,170 for Pinnacle Rocks; \$330 for rock off J. Friend's wharf; \$45 for rocks off Pew's wharf; and \$20 per cubic yard for Babson's Ledge. Contract expired December 20, 1872.
George W. Townsend, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 26, 1872	For doing the following work at Sullivan's River and Sullivan's Falls, Maine, viz: Removing two bridge piers, each, \$3,000; blasting out Hatcher's Rock to such depth as may be necessary below mean low water, for \$4,145 to a depth of 7 feet; \$10,850 to a depth of 8½ feet; and \$13,300 to a depth of 9 feet; and \$840 for blasting out ledge near Hatcher's Rock to a depth of 7 feet, being 24 cubic yards. Contract expires June 10, 1873.
John Beattie, with Major G. K. Warren, Corps of Engineers.	Aug. 26, 1872	For delivering at Port Jefferson Harbor, New York, about 5,000 tons of blasted or quarried granite blocks, and depositing the same in the jetty, at \$2.67 per ton. Contract expires May 10, 1873.
Roderick Mackenzie, with Major G. Weitzel, Corps of Engineers.	Aug. 27, 1872	For doing work for the improvement of the Wabash River, Indiana, at \$64.25 per day for snagging; \$64.75 per day for dredging; \$2.45 per cubic yard for excavating at Coffee Island Chute; and \$1.50 per cubic yard for wing-dam at Coffee Island Chute. Contract expires within one year.
C. M. Cole, with Major Wm. E. Merrill, Corps of Engineers.	Aug. 28, 1872	For repairing dam on the right of Wheeling Island, Ohio River, and furnishing and putting in place the 2,500 cubic yards of stone, more or less, at \$1.24 per cubic yard. Contract expired December 1, 1872; extended to June 30, 1873.
M. Cole, with Major Wm. E. Merrill, Corps of Engineers.	Aug. 28, 1872	For repairing dam and dike at Buffington Island, Ohio River, and furnishing and putting in place 15,000 cubic yards of stone, at 84 cents per cubic yard. Contract expires December 1, 1873.
Charles Cable, with Major Wm. E. Merrill, Corps of Engineers.	Aug. 28, 1872	For repairing dam at Chartier's Creek, Ohio River, boating and placing in the dam the stone already quarried, and delivering on the bank at Baker's Yard, 75 cents per cubic yard; and furnishing and placing in the dam the additional stone required, \$1.70 per cubic yard. Contract expires December 1, 1872.
E. H. French, with Major John M. Wilson, Corps of Engineers.	Aug. 28, 1872	For constructing 180 feet of pier at Pultneyville, New York, at \$35 per 1,000 feet, board-measure, for Canada or Norway white-pine timber or plank; \$25 for hemlock plank; 50 cents for white-oak snubbing-posts; 10 cents per pound for screw and washer bolts; 7 cents for drift-bolts, and 10 cents for wrought spike; furnishing labor, machinery, tools, &c., \$10 per 1,000 feet, and 2 cents per pound for iron driven. Contract expires September 2, 1872.
E. H. French, with Major John M. Wilson, Corps of Engineers.	Aug. 28, 1872	For dredging in the channel between the piers in the harbor of Big Sodus, New York, at 35 cents per cubic yard. Contract expires July 1, 1873.
Henry J. Mowry, with Major John M. Wilson, Corps of Engineers.	Aug. 30, 1872	For constructing 600 feet of new breakwater at Oswego, New York, at \$28 per 1,000 feet, board-measure, for Canada or Norway white-pine timber; \$21 for hemlock timber; 50 cents per linear foot for snubbing-posts; 8 cents per pound for iron screw and washer bolts; 6 cents for drift-bolts, and 7 cents for wrought spike; \$10 per 100 for tree-nails; \$7 per cord for rubble-stone; \$8 per 1,000 feet for labor, tools, machinery, &c., for construction of break-water of timber used, and 2 cents per pound for iron driven. Contract expires September 2, 1873.
George W. Townsend, with Lieutenant-Colonel George Thom, Corps of Engineers.	Aug. 31, 1872	For removing from the channel at the upper middle bar in Boston Harbor, all bowlders which the engineer in charge may require to have removed, at \$25 per cubic yard, and all ledge that the engineer may require from the upper middle bar, at \$30 per cubic yard. Contract expires May 31, 1873.
Wm. Richardson, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For removing from the main ship-channel of Maumee Bay, Ohio, 40,000 cubic yards of sand and clay, at 29 cents per cubic yard. Contract expires July 1, 1873.

List of contracts made by the Engineer Department and received at the (file) of the Chief of Engineers during the year 1872, &c.—Continued.

Contractors.	Date.	Objects and terms of contracts.
Wm. Richardson, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For furnishing and driving piles and dredging in Monroe Harbor, Michigan, at 40 cents per linear foot, sawed-timber piling; 7 cents per pound for screw-bolts; 9 cents for spike; 35 cents per linear foot for white-oak piles and driving, and 28 cents per linear foot for dredging. Contract expires July 1, 1873.
D. E. Bailey, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For furnishing material and labor for the extension of the east and west piers of Black River Harbor, at \$21 per 1,000 feet, board-measure, for pine and hemlock timber; 7 cents per pound for iron screw-bolts; 5½ cents for drift-bolts, and 6¼ cents for spike; \$8 per cord for rubble-stone, and 35 cents per cubic yard for dredging; 10 cents per linear foot for framing above and below water; and \$8 per 1,000 feet, board-measure, for laying joists and decking. Contract expires July 1, 1873.
Wm. Richardson, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For dredging in Sandusky Bay, leading to Sandusky City, at 24 cents per cubic yard. Contract expires July 1, 1873.
Stock & Rooney, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For dredging in Maumee River, between Maumee City and Toledo, Ohio, at 25 cents per cubic yard. Contract expires July 1, 1873.
O. J. Jennings, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For dredging in the Sandusky River, between Fremont, Ohio, and Sandusky Bay, at 25 cents per cubic yard. Contract expires July 1, 1873.
Hemenway & Garfield, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For furnishing material and labor and constructing a pier in Rocky River Harbor, Ohio, at \$25 per 1,000 feet, board-measure, for pine and hemlock timber; 50 cents per linear foot for piling; 8 cents per pound for screw-bolts; 6 cents for drift-bolts; 9 cents for spikes; \$8 per cord for rubble-stone; 40 cents per cubic yard for dredging for foundation and other dredging; framing below water, 11 cents per linear foot, and 10 cents above water; \$7 per 1,000 feet, board-measure, for joists and decking. Contract expires December 1, 1872.
Lee & Dunbar, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For drilling, blasting, and dredging in the harbor of Ashtabula, Ohio, at \$2.75 per cubic yard for solid rock, 50 cents for loose rock, and 35 cents for dredging sand. Contract expires July 1, 1873.
Lee & Dunbar, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For dredging in the harbor of Erie, Pennsylvania, at 29½ cents per cubic yard. Contract expires July 1, 1873.
Stock & Rooney, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For dredging in Port Clinton Harbor, Ohio, at 35 cents per cubic yard for sand, clay, or gravel. Contract expires July 1, 1873.
O. J. Jennings, with Captain G. L. Gillespie, Corps of Engineers.	Aug. 31, 1872	For drilling, blasting, and dredging in the harbor of Vermillion, Ohio, at \$2.75 per cubic yard for shale rock, \$3 for solid rock, and \$1 for loose rock. Contract expires July 1, 1873.
Dodge & Squier, with Captain S. M. Mansfield, Corps of Engineers.	Sept. 2, 1872	For furnishing all materials except drift-bolts, the labor, machinery, and appliances, and constructing revetment, making repairs, removing sand, earth, and old slab piers, at the harbor of Pere Marquette, Michigan, as may be required, at 28 cents for furnishing, bolting, placing, framing, and putting in place pine timber; 40 cents per linear foot for oak timber; 8 cents per pound for wrought-iron screw-bolts and washers; 6 cents per linear foot for Norway pine piles, and 14 cents for oak; \$12 per cord for stone; \$2 per cord for slabs; 20 cents per linear foot for driving piles; 20 cents per cubic yard for removing slabs above water; 50 cents per cubic yard for dredging below water, and 28 cents for dredging sand or other earth. Contract expires August 1, 1873.
T. Stewart White, with Captain S. M. Mansfield, Corps of Engineers.	Sept. 2, 1872	For constructing and putting in place at the harbor of Grand Haven, Michigan, such revetment and repairs as may be required, at 27 cents per linear foot for pine timber; 40 cents and 26 cents, respectively, for oak; 12 cents per linear foot for white-oak piles; 6 cents per pound for drift-bolts; \$8 per strap for wrought-iron straps; \$12 per cord for stone; \$1.90 for slabs, and 19 cents per foot for driving piles. Contract expires July 1, 1873.
T. Stewart White, with Captain S. M. Mansfield, Corps of Engineers.	Sept. 2, 1872	For constructing revetment, making such repairs, and removing sand, earth, or old slab piers, as may be necessary, at the harbor of Pentwater, Michigan, at 27 cents per cubic foot for pine timber; 40 cents and 25 cents respectively for oak timber; 6 cents per pound for iron drift-bolts; 8 cents for screw-bolts and washers; 6 cents per linear foot for Norway pine piles and 12 cents for oak; \$1.50 per cord for stone; \$1.45 for slabs; 18 cents per linear foot for driving piles; 20 cents per cubic yard for removing slabs above water; 30 cents per cubic yard for dredging below water, and 24½ cents per cubic yard for dredging sand or other earth. Contract expires September 1, 1873.
Carken and Stickney, with Major O. M. Poe, Corps of Engineers.	Sept. 2, 1872	For dredging in the harbor of Cheboygan, Michigan, at 22½ cents per cubic yard. Contract expires June 15, 1873.

John Roost, with Captain S. M. Mansfield, Corps of Engineers.	Sept. 2, 1872	For constructing and putting in place in the harbor of Saugatuck, Michigan, a pile pier, at 30 cents per linear foot for pine timber; 32 cents and 28 cents for oak, according to size; 15 cents per linear foot for white-oak piles; 6½ cents per pound for drift-bolts and washers, and 7½ cents for screw-bolts and washers; \$11 per cord for stone, and \$1.50 for handling slabs; 30 cents per foot for driving piles. Contract expires September 1, 1873.
John Roost, with Captain S. M. Mansfield, Corps of Engineers.	Sept. 2, 1872	For constructing and putting in place at the harbor of Black Lake, Michigan, such pile revetment as may be required, at 25 cents per linear foot for pine timber; 28 cents and 32 cents for oak; 14 cents per linear foot for white-oak piles, and 20 cents for driving same; 6 4-5 cents per pound for drift-bolts; 7 4-5 cents for screw-bolts and washers; \$10.50 per cord for stone; \$3 for slabs. Contract expires January 1, 1873.
O. J. Jennings, with Major F. Harwood, Corps of Engineers.	Sept. 2, 1872	For constructing a section of breakwater at Dunkirk, New York, at \$19 per 1,000 feet, board-measure, for hemlock timber; \$25 for hard-pine timber and lumber; \$40 for white-oak timber; 5.2 cents per pound for iron drift-bolts; 8 cents for nut, screw, and washer bolts; 5½ cents for wrought-iron bevel bolts; 6½ cents for wrought-iron spikes; 14 cents per linear foot for framing, placing, boring for bolting, bolting and securing in place the work under water of all crib-work, and the same for superstructure; \$10 per cord for stone; \$12 per 1,000 feet, board-measure, for fitting, gaining, and fastening all joists, scantling, planks, and boards. Contract expires June 30, 1873.
James Caldwell, with Captain S. M. Mansfield, Corps of Engineers.	Sept. 3, 1872	For constructing and sinking cribs in the harbor of South Haven, Michigan, at 29 cents per cubic foot for hemlock timber; 32 cents for pine and 40 cents for oak; 7 cents per pound for drift-bolts; 9 cents for screw-bolts; \$12 per cord for stone and \$4 for slabs. Contract expires June 1, 1873.
Thomas M. Hubbell, with Major O. M. Poe, Corps of Engineers.	Sept. 4, 1872	For dredging at the mouth of Black River, in Saint Clair River, Michigan, at 28 cents per cubic yard. Contract expires September 1, 1873.
George W. Townsend, with Major G. K. Warren, Corps of Engineers.	Sept. 4, 1872	For removing from Saybrook Bar, at the mouth of the Connecticut River, all the wreck of the schooner Bay State, for \$800. Contract expires June 30, 1873.
C. T. Yoder, with Major O. E. Babcock, Corps of Engineers.	Sept. 4, 1872	For furnishing the office of Public Buildings, Grounds, and Works with fuel as required, at \$8 per ton for white-ash furnace-coal; \$9.50 per ton for Lykens Valley coal; \$9 for range coal; \$12.50 per cord for pine wood, sawed in eight pieces and split; \$12 per cord for oak sawed in three pieces; and \$9 per cord for bakers' pine wood in sticks. Contract expires as required.
Wells, Timberman & Co., with Colonel J. N. Maccomb, Corps of Engineers.	Sept. 4, 1872	For delivering face, backing, rubble, and slope-wall stone, for the completion of the lower lock and construction of the middle lock of the Des Moines Rapids Canal, at, for the lower lock, \$16 per cubic yard for face-stone; \$7 for backing-stone; \$7 for rubble-stone for vertical or battered wall, and \$5 for rubble-stone for slope-stone; and for the middle lock \$15.50 per cubic yard for face-stone, and \$5 for all backing and rubble-stone. Contract expired December 31, 1872.
F. D. Van Wagenen, with Colonel J. N. Maccomb, Corps of Engineers.	Sept. 4, 1872	For furnishing materials and performing the labor necessary for the completion of the prism and embankment walls of the canal for the improvement of the Des Moines Rapids of the Mississippi River, at \$1,000 for grubbing and clearing; \$4,000 for bailing and draining; 50 cents per cubic yard for earth excavation; \$3.50 per cubic yard for excavating and removing rock; 30 cents per cubic yard for earth borrowed used in embankment; 10 cents per cubic yard for labor of puddling; 50 cents per cubic yard for loose stone borrowed; \$1.25 per cubic yard for labor of laying stone in face of riprap walls; 50 cents per cubic yard for vertical wall laid dry; \$1 per cubic yard for concrete masonry; \$1 per rod for constructing public road, including necessary bridges and abutments, except the bridge at Lamalees Creek. Expiration of contract conditional.
A. R. Wright, with Lieutenant Colonel George Thom, Corps of Engineers.	Sept. 9, 1872	For doing the dredge and ledge excavation in Merrimac River, Massachusetts, at Hazeltine Rapids, and at the Lower Falls, Massachusetts, at \$4.95 per cubic yard for dredge excavation, and \$35 per cubic yard for ledge excavation. Contract expires June 30, 1873.
John Screven, mayor, on behalf of the city of Savannah, Georgia, with Major Q. A. Gillmore, Corps of Engineers.	Sept. 10, 1872	For dredging in the Savannah River, Georgia, at 35 and 75 cents per cubic yard, according to locality. Contract expires August 1, 1873.
Dull & Williams, with Colonel J. N. Maccomb, Corps of Engineers.	Sept. 10, 1872	For furnishing all materials, except stone, cement, iron, and lumber, and performing all the labor necessary, and constructing and finishing the lower lock of the Des Moines Rapids Canal, Mississippi River, at \$5,000 for bailing and draining; 50 cents per cubic yard for earth excavation; \$2 for rock excavation; 75 cents per cubic yard for embankment; 50 cents per cubic yard for lining, and same for labor of puddling; \$1 per cubic yard for loose stone borrowed, and \$10 for cut-stone masonry; 5 cents per pound for handling and putting in the work cast and wrought iron; \$500 per lock for sulphur and sand for securing iron-work; \$1.50 per cubic yard for constructing slope wall; \$4 per cubic yard concrete masonry, and \$4 per cubic yard for constructing vertical or battered wall laid in cement. Contract expires contingently.

List of contracts made by the Engineer Department and received at the office of the Chief of Engineers during the year 1872, &c.—Continued.

Contractors.	Date.	Objects and terms of contracts.
Willard Johnson, with Colonel J. N. Macomb, Corps of Engineers.	Sept. 12, 1872	For furnishing all materials, except stone, cement, iron, and lumber, and performing all the labor necessary to construct and finish the middle lock of the Des Moines Rapids Canal, Mississippi River, including all the work necessary to complete the prism of the canal and its banks and walls for 200 feet below the lock walls, and its connections, at \$3,000 for bailing and draining; 40 cents per cubic yard earth, and \$2 for rock excavation; 15 cents for embankment; 40 cents for lining and 5 cents for puddling; 25 cents for loose stone borrowed; \$8 for cut-stone masonry; 1 cent per pound for handling and putting in the work all cast, and 10 cents for cast iron; \$50 per lock for sulphur and sand; 3 cents per pound for lead and antimony; \$1 per cubic yard for constructing slope wall, and \$3 for battered wall; and \$1 per cubic yard for concrete masonry. Expiration of contract conditional. Contract expired January 1, 1873.
American Dredging Company, by F. A. Cotten, treasurer, with Lieutenant-Colonel J. D. Kurtz, Corps of Engineers.	Sept. 13, 1872	For dredging in the Christiana River, Delaware, at 25, 32, and 37 cents per cubic yard, according to locality. Contract expired January 1, 1873.
Do.....	Sept. 13, 1872	For removing 35 cubic yards of rock in the Christiana River, at \$50 per cubic yard. Contract expired January 1, 1873.
Do.....	Sept. 13, 1872	For removing 730 cubic yards of rock in the Schuylkill River, at \$17 per cubic yard. Contract expires April 30, 1873.
J. H. Teemyer, with Major W. P. Craighill, Corps of Engineers.	Sept. 14, 1872	For dredging in Accotink Creek, Virginia, at 18 cents per cubic yard, deposited on the bank, or 35 cents per cubic yard removed to a distance of one mile on scows. Contract expired December 31, 1872.
Wm. H. Beard, with Lieutenant-Colonel J. D. Kurtz, Corps of Engineers.	Sept. 16, 1872	For excavating a channel in the Schuylkill River, between its mouth and Chestnut-street bridge, Philadelphia, to the amount of 63,000 cubic yards, more or less, at 32 cents per cubic yard. Contract expires August 1, 1873.
Curtis & Fobes, with Lieutenant-Colonel George Thom, Corps of Engineers.	Sept. 17, 1872	For doing all the dredging that may be required in Back Bay, Portland, Maine, at 25 cents per cubic yard. Contract expires June 15, 1873.
J. E. Simpson & Co., with Lieutenant-Colonel J. D. Kurtz, Corps of Engineers.	Sept. 18, 1872	For furnishing all the materials and doing all the work necessary to complete the unfinished pier in the harbor of New Castle, Delaware, for \$6 685. Contract expires May 1, 1873.
American Dredging Co., with Lieutenant-Colonel J. D. Kurtz, Corps of Engineers.	Sept. 20, 1872	For removing the remains of an old pier of crib-work filled with stone at Philadelphia, at \$2,150 for its entire removal. Contract expired January 1, 1873.
Benjamin Maillefert, with Major Q. A. Gillmore, Corps of Engineers.	Sept. 20, 1872	For removing the wrecks of the monitor Weehawken and wooden man-of-war Housatonic and the torpedo-boat; also the wreck of the small river steamer from the harbor of Charleston, South Carolina, at \$4,750 for the Weehawken, \$3,700 for the Housatonic and torpedo-boat, and \$2,150 for the wreck near Fort Sumter, including the proceeds of the wrecks. Contract expires August 1, 1873.
Howard Cook, with Lieutenant-Colonel W. F. Reynolds, Corps of Engineers.	Sept. 21, 1872	For dredging in the Osage River, Missouri, at 35 cents per cubic yard. Contract expires July 1, 1873.
Eager, Ellerman & Co., with Captain C. W. Howell, Corps of Engineers.	Sept. 24, 1872	For constructing a timber dam across Tone's Bayou, Louisiana, at \$18,920. Contract expires June 30, 1873.
James Clark, with Colonel J. N. Macomb, Corps of Engineers.	Sept. 25, 1872	For furnishing cement for lower and middle locks of the canal at the Des Moines Rapids of the Mississippi River, at \$2.48 for hydraulic cement, delivered in casks; \$25 for use of lime-houses for storing cement at lower lock; \$10 for attention and care of cement at lower lock; \$50 for use of lime-house for storing cement at middle lock; \$16 for attention and care of cement at middle lock. Contract expired December 31, 1872.
Willard Johnson, with Lieutenant-Colonel W. F. Reynolds, Corps of Engineers.	Sept. 25, 1872	For furnishing all the brush and stone required for the improvement of the Mississippi River between the mouth of the Illinois River and the mouth of the Missouri River, for the construction of a dam or dams at Alton slough, at \$2.20 per cord for brush, and \$1.45 per cubic yard for riprap stone. Contract expired January 1, 1873.
Do.....	Sept. 25, 1872	For doing the grading and other work required for the improvement of the Mississippi River between the mouth of the Missouri and the mouth of the Meramec River, at 18 cents per cubic yard for grading; 10 cents per square for spreading McAdam, and prices as agreed upon for other work. Contract expires July 1, 1873.
O. D. Parmelly, with Captain C. W. Howell, Corps of Engineers.	Sept. 25, 1872	For removing all timber obstructions to navigation at low water from the Tangipahoa River and its banks, Louisiana, between Wells' Ferry and the mouth of the river, at \$2,200. Contract expires June 30, 1873.

E. R. Seward, with Lieutenant-Colonel John Newton, Corps of Engineers.	Sept. 28, 1872	For dredging 6,600 cubic yards, more or less, in Otter Creek, Vermont, at 39 cents per cubic yard. Contract expires June 30, 1873.
C. H. Bragdon, with Lieutenant-Colonel George Thom, Corps of Engineers.	Sept. 28, 1872	For furnishing stone for the breakwater at Saco, Maine, at \$1.28 per ton for large stone and \$1.18 for small stone. Contract expired November 30, 1872.
James D. Leary, with Lieutenant-Colonel John Newton, Corps of Engineers.	Sept. 28, 1872	For the construction of a crib for the extension of the breakwater at Plattsburgh, Vermont, at \$67.93 per linear foot for the crib-work complete and sunk in position, and \$23.93 per linear foot for the superstructure. Contract expires December 31, 1873.
Dull & Williams, with Colonel J. N. Macomb, Corps of Engineers.	Sept. 28, 1872	For excavating and removing from the bottom of the Mississippi River at the Upper or Rock Island Rapids, all rock and other material necessary to make a continuous channel through the same, at \$12.50 per cubic yard at Winnebago Island; \$14.50 for patches between St. Louis and Campbell's chains, and between Campbell's and Winnebago Island. Contract expires June 1, 1873.
H. C. Woodrow, secretary Grafton Stone Transportation Company, with Lieutenant-Colonel W. F. Reynolds, Corps of Engineers.	Sept. 30, 1872	For furnishing stone and brush for improvement of the Mississippi River between the mouth of the Missouri and the mouth of the Meramec, at \$1.85 per cubic yard for stone in revetment; \$1.15 per cubic yard for stone in riprap; \$4 per square for McAdam; \$4.95 per cord for first-grade brush; and 4.45 per cord for second-grade brush. Contract expires July 1, 1873.
Joel Griffin, with Major Q. A. Gillmore, Corps of Engineers.	Sept. 30, 1872	For removing a small sunken (loaded) schooner and 13 wooden piles in Ashpoo River, South Carolina, for \$1,200. Contract expires January 1, 1873.
Do.....	Sept. 30, 1872	For removing the wrecks of three small wooden vessels lying across the channel of Church Flats in the Stono River, South Carolina, near Charleston, at \$1,800. Contract expires February 1, 1873.
Do.....	Sept. 30, 1872	For removing a portion of the stone jettee, known as "Bowman's Jettee," near Fort Moultrie in Charleston Harbor, at \$4.50 for each cubic yard removed and piled; and \$1,000 and the materials of the wrecks for removing the wreck of a small steamer lying on and near the outer end of said jettee, to a depth of 20 feet at mean low water. Contract expires August 1, 1872.
Gage & Powley, with Lieutenant-Colonel John Newton, Corps of Engineers.	Sept. 30, 1872	For the construction of a pile-dike at Rondout, Hudson River, at entrance of Rondout Creek, at \$9.89 per linear foot, dike complete and filled with stone. Contract expires June 30, 1873.
Thomas J. Hill, with Major G. K. Warren, Corps of Engineers.	Oct. 1, 1872	For excavating in the Providence River, Rhode Island, at the crook and opposite Sassafraz Point, at 25 cents per cubic yard for the former and 37½ for the latter. Contract expires June 30, 1873.
Francis H. Smith, with Major G. K. Warren, Corps of Engineers.	Oct. 1, 1872	For excavating in Housatonic River, Connecticut, between Huntington Landing and Derby, at Two Mile Island Bar, at Crofut's Bar, and, if required, at the mouth of the river, at 23.95 per cubic yard. Contract expires June 30, 1873.
P. L. Dews, with Major G. Weitzel, Corps of Engineers.	Oct. 5, 1872	For doing the work for the improvement of the Cumberland River in accordance with the specifications, at \$5.65 for rock excavation, \$2.35 for riprap dam, \$1 for dredging per cubic yard, and \$300 for removing trees and snags. Contract expired January 1, 1873.
George D. Nagle, with Major G. H. Mendell, Corps of Engineers.	Oct. 1, 1872	For furnishing and putting in place on the line of the breakwater at Wilmington, California, not to exceed 15,000 tons stone, at \$4.25 per ton, and for pieces weighing 200 pounds or less, \$3.49 per ton, in coin or its equivalent. Contract expires June 30, 1873.
J. F. Stephen, with Major H. M. Robert, Corps of Engineers.	Oct. 9, 1872	For the construction of two dumping-scows, for use on the Willamette River, at \$5,200 in legal-tender notes. Contract expires 90 days after closing contract.
T. J. Bulger, with Major H. M. Robert, Corps of Engineers.	Oct. 9, 1872	For constructing a dredge-boat for the Willamette River, Oregon, at \$5,149 in legal-tender notes. Contract expired November 28, 1872.
Willamette Iron-Works Company, with Major H. M. Robert, Corps of Engineers.	Oct. 9, 1872	For the construction of an engine and boiler for the dredge-boat for the Willamette River, Oregon, at \$6,744 in United States legal-tender notes. Contract expired November 28, 1872.
J. B. Montgomery, with Major H. M. Robert, Corps of Engineers.	Oct. 12, 1872	For removing rocks and bowlders from the channel of the Columbia River, Oregon, at the following places and prices: John Day Rock, \$24,100; Devil's Bend, \$8,550; Umatilla Rapids, \$10,000; and for every cubic yard of rock over 200 yards at Umatilla Rapids, \$25. Contract expires April 30, 1873.
Charles Johnson, with Lieutenant Colonel John Newton, Corps of Engineers.	Oct. 14, 1872	For constructing in the Hudson River the following pile-dikes, viz: The northern and southern extensions of the Middle Ground Dike; the completion of the Roah Hook Dike; the extension of Barren Island Dike; the upper and lower sections of the Cedar Hill Dikes; at \$8.97 for the northern extension of Middle Ground Dike, per linear foot; \$5.32 for southern extension of same; \$8 for Roah Hook Dike; \$7.10 for extension of Barren Island Dike; \$6.08 for upper section of Cedar Hill Dike; and \$9.75 for lower section of same; all to be complete and filled with stone. Contract expires June 30, 1873.
A. R. Wright, with Lieutenant Colonel George Thom, Corps of Engineers.	Oct. 26, 1872	For dredging in the harbor of Duxbury, Massachusetts, 17,000 cubic yards, more or less, at 50 cents per cubic yard, measured in the scows. Contract expires June 30, 1873.

List of contracts made by the Engineer Department and received at the office of the Chief of Engineers during the year 1872, &c.—Continued.

List of contracts made by the Engineer Department and received at the office of the Chief of Engineers during the year 1872, &c.—Continued.		Objects and terms of contracts.	
Contractors.	Date.	Objects and terms of contracts.	
Edward Moore, with Lieutenant Colonel George Thom, Corps of Engineers.	Oct. 26, 1872	For excavating and removing the ledge from the lower part of the gulf in the Cochecho River, within the town of Dover, New Hampshire, at \$26.50 per cubic yard. Contract expires June 30, 1873.	
S. A. Hooper, with Colonel J. N. Macomb, Corps of Engineers.	Oct. 29, 1872	For removing snags, logs, stumps, and trees from the Minnesota River, at \$2 for those 4 inches in diameter, and not exceeding 6 inches; \$5 for 6 inches to 20 inches; \$6 from 20 inches to 30 inches; \$8 from 30 inches to 36 inches; \$11 from 36 inches to 42 inches; \$15 from 42 inches to 48 inches. For removing overhanging trees from the banks of the following dimensions, measured one foot above the roots, 75 cents for those 4 inches in diameter, and not exceeding 6 inches; \$1.75 for 6 inches to 20 inches; \$2.50 for 20 inches to 30 inches; \$2.75 for 30 inches to 36 inches; \$3 for 36 inches to 42 inches; \$4 for 42 inches to 48 inches, each; and \$5 per cubic yard for bowlders. Contract expires June 30, 1873.	
Paulding, Kemble & Co., with Lieutenant Colonel J. D. Kurtz, Corps of Engineers.	Oct. 31, 1872	For furnishing one-half of the iron-work for the new United States iron landing-pier now being built at (near) Lewes, Delaware, at 12 cents per pound for all rolled iron; 8½ cents for pile-shafts; 35 cents for screw-buckles; 16 cents for bolts and nuts; 20 cents for collars and clamps; 6½ cents for cast-iron screws and caps; and 45 cents per 100 pounds additional if 10,000 pounds be delivered at railroad-station at Lewes; 35 cents per 100 extra if delivered in quantities of 10,000 pounds at the landing-pier; 40 cents if delivered at railroad-station in quantities of 50,000 pounds; 30 cents if delivered at landing-pier in quantities of 50,000 pounds. Contract expires July 1, 1873.	
David Symons, with Major Q. A. Gillmore, Corps of Engineers.	Oct. 31, 1872	For removing from the channel of the Savannah River, Georgia, 10 cribs and 1 wreck, at \$790 for the cribs, and the same amount for the wreck. Contract expires April 1, 1873.	
Macpherson, Willard & Co., with Lieutenant-Colonel J. D. Kurtz, Corps of Engineers.	Nov. 4, 1872	For delivering for the United States landing (iron) pier near Lewes, Delaware, one-fourth of each kind of iron-work set forth in the specifications attached, at 12 cents per pound for rolled iron; and for hammered iron, 8½ cents for pile-shafts; 35 cents for screw-buckles; 16 cents for bolts and nuts; 20 cents for collars and clamps; and 6½ cents for cast-iron screws and caps. If delivered at railroad station at Lewes, or at landing-pier, to be paid 25 cents per 100 pounds extra; or if delivered at railroad station at Lewes, or at landing pier, in quantities of 50,000 pounds, 25 cents per 100 pounds extra. Contract expires July 1, 1873.	
G. Andrews, president New Orleans Wrecking and Salvage Company, with Captain C. W. Howell, Corps of Engineers.	Nov. 12, 1872	For totally removing from the Tchefuncte River, Louisiana, near the town of Covington, the wreck of the steamer Oregon, at \$4,850. Contract expires June 30, 1873.	
S. R. Dickson, with Major O. E. Babcock, Corps of Engineers.	Nov. 13, 1872	For constructing and putting in place a wrought-iron bridge over the Potomac River, on piers and abutments now standing at the site known as the Chain Bridge, in conformity with specifications attached to and made part of the contract, complete, for \$98,875. Contract expires June 1, 1873.	
Morris & Cummings, with Lieutenant-Colonel John Newton, Corps of Engineers.	Nov. 22, 1872	For dredging the bar at Belleville, on the Passaic River, New Jersey, at \$1.10 per cubic yard for dredging and depositing stone and bowlders, and 90 cents per cubic yard for removing sand and gravel. Contract expires June 30, 1873.	
John Grant, with Colonel J. H. Simpson, Corps of Engineers.	Nov. 22, 1872	For excavating and removing 125,000 cubic yards of material from Dog River Bar, Mobile Bay, Alabama, at 30 cents per cubic yard. Contract expires December 7, 1873.	
Strausz & Rice, with Major W. P. Craighill, Corps of Engineers.	Dec. 16, 1872	For furnishing 4,000 cubic yards of stone for the improvement of the Cape Fear River, at \$4 per cubic yard. Contract expires April 16, 1873.	

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, and those made prior thereto, but not received in time to be included in the last report.

No.	Place and date.	Parties.	Nature of contract.	Bond.
1	Fort Bayard, N. M., September 18, 1871.	Captain A. J. McGonnigle, with H. Kimberlin.	For 100,000 pounds of corn, at 2½ cents per pound.	\$2,000
2	Fort Selden, N. M., September 12, 1871.	Same, with H. Lesinsky.	For 15,000 pounds of bran, at 2½ cents per pound.	300
3	Fort Craig, N. M., September 12, 1871.	Same, with N. Reymond.	For 200,000 pounds of corn, at 2½ cents per pound.	4,000
4	Fort Stanton, N. M., September 25, 1871.	Same, with O. W. McCullough.	For 70,000 pounds of corn, at 2½ cents per pound.	1,000
5	Fort Union Depot, N. M., Sept. 11, 1871.	Same, with W. Kronig.	For 50,000 pounds of oats, at 2½ cents per pound.	1,000
6	Fort Bayard, N. M., September 9, 1871.	Same, with J. E. Griggs.	For 650,000 pounds of corn, at 2 7-10 cents per pound.	10,000
7	Fort Craig, N. M., September 1, 1871.	Same, with M. Vigel.	For 300 cords of wood, at \$4.89 per cord.	1,000
8	Santa Fé, N. M., September 12, 1871.	Same, with S. Wedeles.	For 10,000 pounds of bran, at 2 3-5 cents per pound.	200
9	Fort Union Depot, N. M., Sept. 11, 1871.	Same, with W. Kronig.	For 200,000 pounds of corn, at 2½ cents per pound.	3,000
10	Fort Bayard, N. M., September 9, 1871.	Same, with J. E. Griggs.	For 10,000 pounds of bran, at 3½ cents per pound.	3,000
11	Department of Texas, May 1, 1871.	Lieutenant-Colonel J. A. Ekin, with C. A. Whitney.	For transport (water) on route No. 1, at schedule rates.	30,000
12	Fort Yuma, Ariz., September 1, 1871.	Captain J. G. C. Lee, with J. S. Carr.	For hire of 96 pack-mules, with packers, at \$1.37½ per day.	2,000
13	Fort Harker, Kans., December 15, 1871.	Lieut.-Colonel L. C. Easton, with Larkin & Jackson.	For 140,000 pounds of corn, at \$1.30 per 100 pounds.	2,700
14	Wallace Station, Kans., Dec. 15, 1871.	Same, with Thomas Dixon.	For 60,000 pounds of oats, at \$2.65 per 100 pounds; 208,000 pounds of corn, at \$2.27 per 100 pounds; 52,000 pounds of corn, at \$2.31 per 100 pounds; 52,000 pounds of corn, at \$2.33 per 100 pounds.	2,000
15	Fort Harker, Kans., December 15, 1871.	do.	For 280,000 pounds of corn, at \$1.34 per 100 pounds; 72,000 pounds of oats, at \$1.83 per 100 pounds.	2,000
16	Fort Leavenworth, Kans., Dec. 8, 1871.	Same, with A. J. Williams.	For 628 cavalry-horses, at \$104.73 each.	22,000
17	Fort Whipple, Ariz.	Captain C. W. Foster, with W. B. Hellings.	For 450,000 pounds of corn or barley, at 6.60 cents per pound.	40,000
	Camp Verde.		For 1,350,000 pounds of corn or barley, at 6.98 cents per pound.	
	Date Creek.		For 425,000 pounds of corn or barley, at 5.73 cents per pound.	
18	Date Creek, June 10, 1871.	do.	For 875,000 pounds of corn or barley, at 6.49 cents per pound.	6,000
19	Camp Verde, Ariz., June 10, 1871.	do.	For 2,075,000 pounds of hay, at \$25.91 per ton.	5,000
20	Camp Hualpi, June 10, 1871.	do.	For 650 tons of hay, at \$22.18 per ton.	3,000
21	Fort Whipple, Ariz., June 10, 1871.	do.	For 337½ tons of hay, at \$23.23 per ton.	11,575
22	Louisville, Ky., November 22, 1871.	Major-General M. C. Meigs, with M. W. Snead & Co.	For from 1,000 to 10,000 iron bunks, at \$4.75 each.	3,000
23	New York City, November 27, 1871.	Same, with Composite Iron-Works Company.	For from 1,000 to 10,000 iron bunks, at \$5 each.	
24	Chicago, Ill., November 7, 1871.	Captain James Gilliss, with A. F. Fausett.	For lease of 20 acres, near Chicago, Ill., at \$64.37 per month.	
25	New Orleans, La., December 1, 1871.	Captain James Belger, with H. O. Ames.	For lease of buildings, at \$175 per month.	
	Charleston, S. C., July 1, 1871.	Major A. R. Eddy, with Knox & Wheelock.	For oak wood, as required, at \$5.24 per cord; for pine wood, as required, at \$3.99 per cord.	1,000
26	London Park Cemetery, Dec. 13, 1871.	Major H. C. Hodges, with J. H. Taylor.	For building stone wall, per linear foot, \$3.85.	1,200
27	Jeffersonville, Ind., November 15, 1871.	Captain C. H. Hoyt, with Cook & Co.	For 5,000 bushels of Pittsburgh coal, at 32 cents per bushel.	1,000
28	Fort Concho, Tex., May 1, 1871.	Lieutenant-Colonel J. A. Ekin, with I. B. Trainer.	For 225,000 pounds of oats, at \$2.29 per bushel.	5,000
29	do.	Same, with Adams & Wickes.	For 1,300,000 pounds of hay, at \$26.93 per ton.	6,000
30	do.	Same, with J. D. Burgess.	For 225,000 pounds of barley, at \$3.60 per bushel.	5,000
31	do.	Same, with A. Faltin.	For 870,000 pounds of corn, at \$2.57 per bushel.	13,000
32	do.	Same, with E. McCrohon.	For 1,000 bushels of charcoal, at 38 cents per bushel.	125
33	do.	Same, with B. J. De Witt.	For 1,200 cords of wood, at \$3.98 per cord.	1,600
34	do.	Same, with George Appman.	For 400,000 pounds of hay, at \$24.50 per ton.	1,600
35	San Antonio, Tex., May 1, 1871.	Same, with J. A. Durand.	For 3,000 cords of wood, at \$4.20 per cord.	4,000
36	do.	Same, with W. C. Kroeger.	For 300,000 pounds of oats, at \$1.38 cents per bushel.	4,500
37	do.	Same, with Adams & Wickes.	For 150,000 pounds of barley, at \$1.73 per bushel.	2,000

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
38	San Antonio, Tex., May 1, 1871.....	Lieutenant-Colonel J. A. Ekin, with J. A. Durand..	For 3,000 bushels of charcoal, at 30 cents per bushel.....	\$500
39	do.....	Same, with Adams & Wickes.....	For 2,600,000 pounds of hay, at \$14.73 per ton.....	6,000
40	do.....	Same, with B. R. Lappington.....	For 1,200,000 pounds of corn, at \$1.44 per bushel.....	10,000
41	Fort Richardson, Tex., May 1, 1871.....	Same, with F. A. Sheets.....	For 2,000 cords of wood, at \$4.99 per cord.....	3,500
42	do.....	Same, with C. G. Napier.....	For 4,300,000 pounds of hay, at \$23.98 per ton.....	15,000
43	do.....	Same, with W. N. McKarney.....	For 1,100,000 pounds of oats, at \$2.29 per bushel.....	25,000
44	do.....	Same, with E. Johnston, jr.....	For 1,500 bushels of charcoal, at 75 cents per bushel.....	400
45	Fort Davis, Tex., May 1, 1871.....	Same, with W. Hagelseib.....	For 420,000 pounds of corn, at \$1.98½ per bushel.....	5,000
46	do.....	do.....	For 200,000 pounds of barley, at \$2.12 per bushel.....	3,000
47	do.....	Same, with W. Hagelseib.....	For 1,300,000 pounds of hay, at \$19.95 per ton.....	5,000
48	do.....	Same, with J. D. Burgess.....	For 200,000 pounds of corn, at \$2.08 per bushel.....	2,500
49	do.....	Same, with H. W. Tinkham.....	For 800 bushels of charcoal, at 48½ cents per bushel.....	130
50	do.....	Same, with S. R. Miller.....	For 800 cords of wood, at \$4 per cord.....	1,000
51	Baton Rouge, La., May 1, 1872.....	Same, with J. S. Chapman.....	For 1,000 cords of wood, at \$4.94 per cord.....	1,500
52	Ringgold Barracks, Tex., May 1, 1871..	Same, with J. Galvan.....	For 260,000 pounds of oats, at \$1.45 per bushel.....	4,000
53	do.....	Same, with V. Mosel.....	For 800 bushels of charcoal, at 35 cents per bushel.....	100
54	do.....	Same, with H. Chamberlain, jr.....	For 1,000,000 pounds of hay, at \$19.25 per ton.....	3,500
55	do.....	Captain B. C. Card, with H. Chamberlain, jr.....	For 500 cords of wood, at \$2.89 per cord.....	500
56	do.....	Lieutenant-Colonel J. A. Ekin, with H. Chamberlain, jr.....	For 520,000 pounds of corn, at \$1.59 per bushel.....	5,000
57	Fort Brown, Tex., May 1, 1871.....	Same, with A. Wood.....	For 1,000,000 pounds of hay, at \$24 per ton.....	4,000
58	do.....	Same, with A. Wirbiski.....	For 1,500 cords of wood, at 2.74 per cord.....	1,500
59	do.....	Same, with J. Galvan.....	For 250,000 pounds of oats, at \$1.12½ per bushel.....	3,000
60	do.....	do.....	For 500,000 pounds of corn, at \$1.37½ per bushel.....	4,000
61	Jackson Barracks, La., May 1, 1871.....	Same, with S. M. Woodward.....	For 1,000 cords of wood, at \$8.13 per cord.....	3,000
62	Fort Stockton, Tex., May 1, 1871.....	Same, with J. D. Burgess.....	For 400,000 pounds of hay, at \$21.50 per ton.....	1,500
63	do.....	Same, with W. Hagelseib.....	For 250 tons of hay, at 20.45 per ton.....	1,700
64	do.....	Same, with Adams & Wickes.....	For 320,000 pounds of barley, at \$2.33 per bushel.....	5,000
65	do.....	Same, with W. Hagelseib.....	For 80,000 pounds of barley, at \$2.22 per bushel.....	1,200
66	do.....	Same, with P. Johnson.....	For 1,500 bushels of charcoal, at 70½ cents per bushel.....	350
67	do.....	Same, with C. Torres.....	For 800,000 pounds of corn, at \$2.06½ per bushel.....	10,000
68	do.....	Same, with Thos. Johnson.....	For 200,000 pounds of hay, at \$17.40 per ton; 200,000 pounds of hay, at \$18.30 per ton; 200,000 pounds of hay, at \$19.25 per ton.....	2,000
69	do.....	Same, with P. Gallagher.....	For 800 cords of wood, at \$8.50 per cord.....	2,300
70	Fort Griffin, Tex., May 1, 1871.....	Same, with Norton & Dentz.....	For 2,300,000 pounds of hay, at \$21.40 per ton.....	8,000
71	do.....	Same, with Adams & Wickes.....	For 1,200,000 pounds of corn, at \$2.63 per bushel.....	18,000
72	do.....	do.....	For 600,000 pounds of oats, at \$2.83 per bushel.....	18,000
73	do.....	Same, with Wm. Lehue.....	For 500 bushels of charcoal, at \$1 per bushel.....	2,000
74	do.....	Same, with Norton & Dentz.....	For 1,500 cords of wood, at \$4.74 per cord.....	2,000
75	Austin, Tex., July 12, 1871.....	Captain B. C. Card, with G. M. Brass.....	For 30,000 pounds of corn, at \$1.55 per bushel.....	800
76	do.....	Captain B. C. Card, with J. B. Weems.....	For 100 cords of wood, at \$7.50 per cord.....	300
77	Fort McKavitt, Tex., May 1, 1871.....	Lieutenant-Colonel J. A. Ekin, with Adams & Wickes.....	For 2,100,000 pounds of hay, at \$24.33 per ton.....	9,000
78	do.....	Same, with J. B. Trainer.....	For 520,000 pounds of oats, at \$2.09 per bushel.....	12,000
79	do.....	Same, with A. Faltin.....	For 1,040,000 pounds of corn, at \$2.39 per bushel.....	15,000

80	do	Same, with Williams, Poe & Danley	For 600 bushels of charcoal, at 40 cents per bushel	100
81	do	Same, with J. S. Nixon	do	100
82	do	Same, with S. Wallick & Co	For 1,500 cords of wood, at \$3.63 per cord	1,800
83	Fort Quitman, Tex., May 1, 1871	Same, with W. E. Sweet	For 500 bushels of charcoal, at 37 cents per bushel	75
84	do	Captain B. C. Card, with H. Lesinsky	For 100,000 pounds of corn, at \$2.13 per 100 pounds; 550,000 pounds of corn, at \$2.25 per 100 pounds	5,000
85	Fort Duncan, Tex., May 1, 1871	Lieut.-Colonel J. A. Ekin, with Adams & Wickes	For 520,000 pounds of corn, at \$1.63 per bushel	5,000
86	do	do	For 800 cords of wood, at \$5.33 per cord	1,500
87	do	do	For 260,000 pounds of oats, at \$2.23 per bushel	6,000
88	do	Same, with F. Gross	For 400 bushels of charcoal, at 75 cents per barrel	50
89	do	Same, with H. Pohler	For 1,000,000 pounds of hay, at \$18.54 per ton	3,000
90	Fort McIntosh, May 1, 1871	Same, with Thos. Gilligan	For 200,000 pounds of barley, at \$1.44 per bushel	2,000
91	do	Same, with C. M. Macdonell	For 300 cords of wood, at \$2.90 per cord	300
92	do	do	For 900 bushels of charcoal, at 1 cent per pound	100
93	do	do	For 400,000 pounds of corn, at \$1.54 per bushel	4,000
94	do	do	For 500,000 pounds of hay, at \$14.75 per ton	2,000
95	Fort Clark, Tex., May 1, 1871	Same, with I. P. Alexander	For 600 bushels of charcoal, at 39 cents per bushel	100
96	do	Same, with J. Cornell	For 200 cords of wood, at \$2.25 per cord	150
97	do	Same, with I. P. Alexander	For 1,200 cords of wood, at \$2.24 per cord	700
98	do	Same, with J. McCormick	For 600 bushels of charcoal, at 39 cents per bushel	100
99	do	Same, with Adams & Wickes	For 900,000 pounds of corn, at \$1.83 per bushel	10,000
100	do	do	For 450,000 pounds of oats, at \$2.23 per bushel	10,000
101	do	Same, with J. Cornell	For 1,800,000 pounds of hay, at \$8.25 per ton	2,500
102	Fort Bliss, Tex., May 1, 1871	Same, with W. B. Blanchard	For 300 cords of wood, at \$5.95 per cord	600
103	do	Same, with D. R. Diffenderfer	For 700,000 pounds of hay, at \$13 per ton	1,500
104	do	Same, with H. Lesinsky	For 28,000 pounds of corn, at \$1.0475 per bushel; 37,000 pounds of corn, at \$1.1144 per bushel; 400,000 pounds of corn, at \$1.1816 per bushel	3,300
105	Fort Richardson, Tex., December 1, 1870	Same, with Adams & Wickes	For 1,300 cords of wood, at \$9.33 per cord	4,000
106	Laredo, Tex., July 1, 1871	Captain B. C. Card, with S. M. Jarvis, mayor	For lease of premises for erection of quarters, at \$50 per month	3,000
107	Jeffersonville, Ind., September 15, 1871	Captain C. H. Hoyt, with Forsyth & Craig	For 5,000 sets common "A" tent-poles, at 66 cents per set	1,500
108	Jeffersonville, Ind., July 31, 1871	Same, with J. Griffith & Son	For 90,000 feet of sheathing lumber, at \$25 per 1,000 feet	3,000
109	San Antonio, Tex., November 1, 1871	Lieut.-Colonel J. A. Ekin, with Adams & Wickes	For 55 mules, at \$150 each	2,000
110	do	Same, with E. Meyer & Co	For 50 mules, at \$130 each	4,000
111	do	Same, with H. Hitzig	For 75 mules, at \$149.50 each	4,000
112	Camp Apache, Ariz., May 13, 1871	Captain J. G. C. Lee, with T. F. Harwood	For 600 tons of hay, at \$41.95 per ton	4,000
113	Camp Gaston, Cal., August 22, 1871	Lieutenant G. W. Kingsbury, with W. H. Mastin	For 1,110 cords of wood, at \$5, coin, per cord	4,000
114	Baltimore, Md., December 30, 1871	Captain C. A. Allgood, A. A. Q. M., with J. R. Kelso	For lease of premises, at \$150 per month	3,000
115	Fort Lyon, Colo., December 4, 1871	Lieutenant-Colonel L. C. Easton, with S. G. Bridges & Co.	For 200,000 pounds of corn, at \$2.36 per 100 pounds; 75,000 pounds of oats, at \$2.98 per 100 lbs.; 25,000 pounds of bran, at \$3.16 per 100 lbs.	3,000
116	Fort Selden, N. Mex., September 12, 1871	Captain A. J. McGonnigle, with T. J. Bull	For 200,000 pounds of corn, at 2 1-5 cents per pound	2,000
117	Fort Stanton, N. Mex., September 1, 1871	Same, with E. Fritz	For 900,000 pounds of corn, at 3 1-2 cents per pound	15,000
118	Fort Richardson, Tex., December 1, 1871	Lieutenant-Colonel J. A. Ekin, with J. W. Vaden	For 1,000,000 pounds of corn, at \$3.99 per 100 pounds	10,000
119	Fort Riley, Kans., January 10, 1872	Lieutenant-Colonel L. C. Easton, with Thos. Dixon	For 120,000 pounds of corn, at \$1.26 1/2 per 100 pounds, in January; 100,000 pounds of oats, at \$1.61 1/2 per 100 pounds, in January; 60,000 pounds of corn, at \$1.29 per 100 pounds, in February; 50,000 pounds of oats, at \$1.67 per 100 pounds, in February; 60,000 pounds of corn, at \$1.29 per 100 pounds, in March; 50,000 pounds of oats, at \$1.71 per 100 pounds, in March; 60,000 pounds of corn, at \$1.30 per 100 pounds, in April; 50,000 pounds of oats, at \$1.73 per 100 pounds, in April; 60,000 pounds of corn, at \$1.30 per 100 pounds, in May; 50,000 pounds of oats, at \$1.73 per 100 pounds, in May; 60,000 pounds of bran, at \$1.39 per 100 pounds, in February.	3,500

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
120	Fort Riley, Kans., January 10, 1872.....	Same, with T. Weichselbaum	For 120,000 pounds of corn, at 90 cents per 100 pounds, in January; 60,000 pounds of corn, at 92 cents per 100 pounds, in February; 60,000 pounds of corn, at 92 cents per 100 pounds, in March; 60,000 pounds of corn, at 95 cents per 100 pounds, in April; 60,000 pounds of corn, at 95 cents per 100 pounds, in May.	\$1,200
121	Hays City, Kans., January 10, 1872.....	Same, with Thos. Dixon.....	For 36,000 pounds of bran, at \$2.44 per 100 pounds.....	300
122	New Orleans, La., January 17, 1872.....	Major Jas. Belger, with J. O. Landry & Co	Lease to Landry & Co. of Saint Louis warehouses, at \$250 per month.....	2,000
123	Camp Bidwell, Cal., November 27, 1871..	Lieutenant W. H. Winters, A. A. Q. M., with J. Ayres.....	For 200,000 pounds of barley, at 2.37 cents per pound; 100,000 pounds of oats, at 2.37 cents per pound.....	3,500
124	New Orleans, La., January 10, 1872	Major Jas. Belger, with H. O. Ames	For lease of buildings on Magazine street, at \$208.33 per month.....	.....
125	Camp McDowell, Ariz., November 27, 1871.	Lieutenant A. D. King, A. A. Q. M., with J. Smith & Co.....	For 700 cords of wood, at \$7.95 per cord	3,000
126	Hays City, Kans., February 1, 1872	Lieutenant-Colonel L. C. Easton, with Thos. Dixon.....	For 160,000 pounds of corn, at \$1.66 per 100 pounds, in January; 160,000 pounds of corn, at \$1.73 per 100 pounds, in February; 160,000 pounds of corn, at \$1.77 per 100 pounds, in March; 160,000 pounds of corn, at \$1.78 per 100 pounds, in April; 160,000 pounds of corn, at \$1.79 per 100 pounds, in May; 160,000 pounds of corn, at \$1.79 per 100 pounds, in June.	4,000
127	Hays City, Kans., January 27, 1872.....	Same, with O. Duffy	For 78,000 pounds of oats, at \$2.19 per 100 pounds; 18,000 pounds of bran, at \$1.90 per 100 pounds.....	500
128	Fort Quitman, Tex., September 11, 1871..	Lieutenant-Colonel J. A. Ekin, with W. E. Sweet ..	For 400 cords of wood, at \$4.74 per cord	700
129	do	do	For 800,000 pounds of hay, at \$13.90 per ton.....	2,000
130	Camp McDowell, Ariz., October 31, 1871..	Lieutenant S. P. Jocelyn, A. A. Q. M., with J. Smith & Co.....	For hay, as required, at \$35 per ton, (Government farm;) hay, as required, at \$29.25 per ton, (Government farm.)	5,000
131	Transportation on Missouri River, March 1, 1872.	Colonel D. H. Rucker, with Grant Marsh	For transportation on the Missouri River, at schedule rates.....	100,000
132	Santa Fé, N. Mex., September 1, 1871.....	Captain A. J. McGonnigle, with B. Seligman	For 200,000 pounds of corn, at \$1.97 per 100 pounds.....	3,000
133	Fort Leavenworth, Kans., February 23, 1872.	Lieutenant-Colonel L. C. Easton, with G. B. White.....	For 215,000 pounds of oats, at \$1.33 per 100 pounds	1,000
134	Transportation in Dakota, &c., February 14, 1872.	Lieutenant-Colonel S. B. Holabird, with N. P. Clarke.....	For transportation over route No. 4, at \$1.23 per 100 pounds per 100 miles.	100,000
135	Transportation in Montana, March 4, 1872.	Same, with W. Hudnell	For transportation in Montana, at \$1.05 cents per 100 pounds per 100 miles.	100,000
136	Nashville, Tenn., and Murfreesborough, Tenn., February 14, 1872.	Lieutenant-Colonel J. C. McFerran, with J. Sloan.....	For coping walls of national cemetery, at \$1 per linear foot	4,000
137	Marietta, Ga., February 17, 1872	Same, with Swan & Brown	For coping walls of national cemetery, at \$1.40 per linear foot.....	2,500
138	Saint Louis and Fort Leavenworth, Kans., March 22, 1872.	Lieutenant-Colonel L. C. Easton, with J. R. Bartlett ..	For transportation to Fort Richardson, at \$5.72 per 100 pounds; transportation to Fort Griffin, at \$6.82 per 100 miles.	40,000
139	Santa Fé, N. Mex., August 24, 1871	Captain A. J. McGonnigle, with N. Eldodt	For 25,000 pounds of oats, at 31.5 cents per pound	1,000
140	Philadelphia, Pa., April 4, 1872.....	Major H. C. Hodges, with A. C. Craig	For lease of premises, at \$50 per month.....	.....
141	Saint Louis, Mo., April 2, 1872.....	Captain Geo. H. Weeks, with Robt. Reilly.....	For 61 mules, at \$124.74 each.....	10,000
142	Department of Tex., May 1, 1871.....	Lieutenant-Colonel J. A. Ekin, with Kenedy & King ..	For transportation on route No. 3, at schedule rates.....	30,000
143	do	do	For transportation on route No. 2, at schedule rates, (freight).....	30,000
144	do	do	For transportation on route No. 2, at schedule rates, (officers and men).....	10,000

145	Department of the Missouri, March 26, 1872	Lieutenant-Colonel L. C. Easton, with E. B. Allen..	For transportation on route No. 2, at schedule rates	60,000
146	Fort Monroe, Va., March 11, 1872	Captain E. B. Carling, with R. J. & W. Neeley & Co.	For 12,000 feet of oak decking, at \$33 per 1,000 feet; 82 fender piles, at \$5 each; 150 oak piles, at \$3.50 each; 4,000 feet of capping and sills, at \$30 per 1,000 feet.	1,000
147	San Francisco, Cal., April 2, 1872	Captain G. C. Smith, with N. Richard	For 840,000 pounds of bituminous coal, at \$8.45, coin, per ton.	1,000
148	West Point, N. Y., April 15, 1872	Captain T. McGree, A. A. Q. M., with C. B. Bishop.	For 6,000 bushels of oats, at 57 cents per bushel; 5 tons of shorts, at \$35 per ton; 5 tons of middlings, at \$38 per ton.	946
149	do	Same, with Welting & Osgood	For 200 tons of hay, at \$35 per ton; 70 tons of straw, at \$26.50 per ton.	2,220
150	Chicago, Ill., April 9, 1872	Captain J. Gilliss, with C. T. Wheeler	For lease of premises for headquarters, at \$300 per month.	10,000
151	Fort Concho, Tex., February 28, 1872	Lieutenant-Colonel J. A. Ekin, with W. Wahr- mund.	For 67,000 pounds of corn, at \$5.87 per 100 pounds	6,000
152	do	Same, with P. Gallagher	For 35,000 pounds of oats, at \$7.16 per 100 pounds	500
153	Detroit, Mich., April 30, 1872	Major J. A. Potter, with M. Stewart	For lease of premises for headquarters, at \$91.67 per month	1,500
154	Jacksonville, Oreg., December 19, 1871	Captain H. W. Jones, with A. J. Brown	For transportation of military mails between Jacksonville, Oregon, and Fort Klamath, Oregon, at \$160 per month, (coin.)	200
155	Fort Ripley, Minn., April 10, 1872	Lieutenant-Colonel S. B. Holabird, with J. Hasle- hurst.	For 548 cords of wood, at \$4.40 per cord	3,500
156	do	do	For 65 tons of hay, at \$6.20 per ton	600
157	Fort Wadsworth, Dak., April 17, 1872	Same, with C. B. Foster	For 575 cords of wood, at \$10.50 per cord	4,000
158	Fort Wadsworth, Dak., April 1, 1872	do	For 200 tons of hay, at \$5 per ton	100
159	Fort Abercrombie, May 1, 1872	Same, with E. W. Brenner	For 1,213 tons of hay, at \$5.45 per ton	500
160	Fort Snelling, May 1, 1872	do	For 24 tons of straw, at \$4 per ton	2,500
161	Fort Snelling, May 23, 1872	Lieutenant-Colonel C. H. Tompkins, with J. Mur- pene.	For 70 tons of hay, at \$9.45 per ton	1,000
162	Fort Snelling, May 25, 1872	Same, with O. O. Cullen	For 792 cords of wood, at \$5.48 per cord	1,000
163	Brulé Agency, May 28, 1872	Same, with J. Killilay	For 546 cords of wood, at \$3.74 per cord	5,000
164	Fort Stevenson, May 22, 1872	Same, with A. H. Wilder	For 101 tons of hay, at \$14 per ton	100
165	Fort Rice, Dak., May 21, 1872	Same, with N. Myrick	For 2,728 cords of wood, at \$4.90 per cord	6,000
166	Sioux City, Iowa, May 27, 1872	Same, with L. G. Bourret	For 294 cords of wood, at \$4.99 per cord	3,000
167	do	Same, with W. Gribble	For 31 tons of hay, at \$6.40 per ton	8,000
168	Fort Buford, Dak., May 25, 1872	Same, with J. S. Day	For 2,506 cords of wood, at \$7.45 per cord	500
169	Fort Buford, Dak., May 24, 1872	Same, with A. H. Wilder	For 491 tons of hay, at \$19.95 per ton	500
170	Fort Ellis, Mont., May 21, 1872	Same, with C. T. Miller	For 955 tons of hay, at \$17.90 per ton	500
171	Grand River agency, May 23, 1872	Same, with D. Stevenson	For 95 tons of hay, at \$13 per ton	500
172	Cheyenne agency, May 23, 1872	do	For 50 tons of hay, at \$10.39 per ton	500
173	Brulé agency, May 24, 1872	Same, with McCay & Volen	For 67 tons of hay, at \$10.73 per ton	500
174	Fort Rice, Dak., May 29, 1872	Same, with L. G. Bourret	For 91 tons of hay, at \$12.99 per ton	500
175	Fort Stevenson, June 10, 1872	Same, with A. H. Wilder	For 155 tons of coal, at \$7 per ton	200
176	Fort Bliss, Tex., January 15, 1872	Lieutenant-Colonel J. A. Ekin, with G. Butschofsky.	For 100 cords of wood, at \$5.87½ per cord	7,500
177	Fort Concho, Tex., May 1, 1872	Captain B. C. Card, with P. Gallagher	For 910,000 pounds of corn, at \$2.39 per bushel	9,000
178	do	do	For 455,000 pounds of oats, at \$1.99 per bushel	15,000
179	Fort Griffin, Tex., May 1, 1872	Same, with W. H. Hick	For 1,000,000 pounds of corn, at \$2.53 per bushel	7,000
180	do	do	For 1,900,000 pounds of hay, at \$23.73 per ton	3,000
181	Fort Duncan, Tex., May 1, 1872	Same, with F. Gross	For 155,000 pounds of oats, at \$1.76 per bushel	4,000
182	do	do	For 310,000 pounds of corn, at \$1.90 per bushel	2,000
183	do	Same, with W. Stone	For 800 cords of wood, at \$7.95 per cord	6,000
184	San Antonio, May 1, 1872	Same, with J. C. Ross	For 2,000,000 pounds of hay, at \$17.50 per ton	7,000
185	do	Same, with P. Gallagher	For 475,000 pounds of oats, at \$1.25 per bushel	2,000
186	Fort Stockton, Tex., May 1, 1872	Same, with T. Johnson	For 800 cords of wood, at \$7.45 per cord	250
187	do	do	For 1,000 bushels of charcoal, at 68 cents per bushel	8,000
188	San Antonio, Tex., May 1, 1872	Same, with Movecick & Kroeger	For 925,000 pounds of corn, at \$1.46 per bushel	

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
189	Fort McIntosh, May 1, 1872.	Captain B. C. Card, with J. E. Ochse & Co.	For 200 cords of wood, at \$3.93 per cord.	\$300
190	Fort Davis, Tex., May 1, 1872.	Same, with A. F. Wulff.	For 170,000 pounds of barley, at \$2.13 per bushel.	2,500
191	Fort Concho, Tex., May 1, 1872.	Same, with W. Lehue.	For 800,000 pounds of hay, at \$22.98 per ton; 190,000 pounds of hay, at \$23.98 per ton.	4,000
192	Fort Griffin, Tex., May 1, 1872.	Same, with Buckman & Dambeck.	For 1,400 cords of wood, at \$5.49 per cord.	3,000
193	Fort McKavitt, May 1, 1872.	Same, with Moverick & Kroeger.	For 1,205,000 pounds of hay, at \$27.30 per ton.	5,000
194	Fort Clark, Tex., May 1, 1872.	Same, with F. Taylor.	For 340,000 pounds of corn, at \$1.44 per bushel.	3,000
195	Fort Concho, Tex., May 1, 1872.	Same, with A. O. Doherty.	For 1,000 bushels of charcoal, at 50 cents per bushel.	200
196	do.	Same, with J. D. Millsbaugh.	For 400,000 pounds of hay, at \$18 per ton; 400,000 pounds of hay, at \$20.38 per ton.	3,000
197	Fort McKavitt, May 1, 1872.	Same, with P. Gallagher.	For 310,000 pounds of oats, at \$1.89 per bushel.	7,000
198	Fort Davis, Tex., May 1, 1872.	do.	For 600 cords of wood, at \$4 per cord.	800
199	Fort Clark, Tex., May 1, 1872.	Same, with F. Gross.	For 170,000 pounds of oats, at \$1.7920 per bushel.	3,000
200	Fort Stockton, May 1, 1872.	Same, with P. Gallagher.	For 195,000 pounds of barley, at \$1.90 per bushel.	3,000
201	do.	do.	For 161,000 pounds of corn, at \$1.98 per bushel.	2,000
202	Fort Duncan, Tex., May 1, 1871.	Same, with M. Ban.	For 600,000 pounds of hay, at \$14.75 per ton.	1,500
203	do.	do.	For 500 bushels of charcoal, at 25 cents per bushel.	100
204	Cheyenne agency, May 25, 1872.	Lieutenant-Colonel C. H. Tompkins, with L. Volin.	For 800 cords of wood, at \$4.92 per cord.	2,000
205	Grand River agency, May 25, 1872.	do.	For 850 cords of wood, at \$4.75 per cord.	2,000
206	Fort Pembina, Dak., June 10, 1872.	Same, with A. W. Stiles.	For 211 cords of wood, at \$3.60 per cord.	500
207	Fort Totten, Dak., May 31, 1872.	Same, with Brenner & Terry.	For 21 tons of hay, at \$7 per ton.	100
208	Fort Randall, Dak., June 1, 1872.	Same, with A. G. Fuller.	For 1,581 cords of wood, at \$4.85 per cord.	2,500
209	Sioux City, Iowa, June 11, 1872.	Same, with W. S. Hicks.	For 27,553 bushels of oats, at 52 cents per bushel; 10,893 bushels of corn, at 62 cents per bushel.	10,000
210	Camp Baker, Mont., May 31, 1872.	Same, with Pratt & Majors.	For 65 tons of hay, at \$10.44 per ton.	500
211	Pike'sville arsenal, Md., June 26, 1872.	M. J. Grealish, Ordnance store-keeper, with P. Murray.	For 720 pounds of straw, at \$1 per 100 pounds.	.....
212	do.	Same, with B. H. Classen.	For 39½ cords of wood, at \$6.43 per cord.	150
213	Fort McRae, N. M., September 16, 1871.	Captain A. J. McGonnigle, with M. Vegil.	For 10,000 pounds of bran, at \$2.44½ per 100 pounds.	200
214	Fort Stanton, N. M., September 1, 1871.	Same, with E. Fritz.	For 50,000 pounds of oats, at \$3.95 per 100 pounds.	2,000
215	Fort Selden, N. M., September 12, 1871.	Same, with T. J. Bull.	For 10,000 pounds of bran, at 2 cents per pound.	200
216	Fort Cummings, September 8, 1871.	Same, with S. J. Lyons.	For 150,000 pounds of corn, at \$2.44 per 100 pounds.	3,000
217	Springfield, Mo., June 17, 1872.	Captain E. B. Grimes, with C. C. Avery.	For building stone wall around national cemetery, at \$7.50 per perch.	7,500
218	do.	Same, with A. T. Budlong.	For building lodge, at \$3,200, at national cemetery.	3,200
219	Jefferson City, Mo., June 14, 1872.	Same, with Martin & Rume.	For building wall around national cemetery, at \$5.25 per perch; building stone lodge at national cemetery, at \$4,000.	10,000
220	Nashville, Tenn., June 19, 1872.	Lieutenant-Colonel J. A. Ekin, with Swan & Brown.	For building stone gateway at national cemetery, at \$7,750.	3,000
221	New Orleans, La., June 6, 1872.	Captain W. B. Hughes, with H. O. Ames.	For lease of building, at \$416.66½ per month.	.....
222	do.	do.	For lease of buildings, at \$208.33 per month.	.....
223	Chicago, Ill., June 7, 1872.	Captain J. S. Gillis, with A. L. Wilson.	For lease of premises, at \$375 per month.	.....
224	Chicago, Ill., June 25, 1872.	Same, with O. W. Goit.	For wood, as required, at \$9.75 per cord; Lehigh coal, as required, at \$7.98 per ton; Briar Hill coal, as required, at \$7.85 per ton; kindling-wood, as required, at \$5.98 per cord.	2,000
225	Jeffersonville, Ind., May 22, 1872.	Captain C. H. Hoyt, with Armstrong & Co.	For 5,000 bushels of Pittsburgh coal, at 15½ cents per bushel.	1,000
226	Camp McDermott, Nev., May 11, 1871.	Major C. G. Sawtelle, with J. Matthews.	For 30 cavalry horses, at \$125 each.	3,000

227	Benicla Barracks, April 30, 1872.....	Same, with J. S. McCue	For 24 cavalry horses, at \$109 each	2,500
228	Camp Halleck, May 15, 1872.....	Lieutenant G. R. Bacon, A. A. Q. M., with W. M. Hoag.....	For 900 cords of wood, at \$10.70 (currency) per cord; 700,000 pounds of hay, at \$17.60 per ton; 600,000 pounds of barley, at 3.6 cents per pound; 140,000 pounds of straw, at \$17.60 per ton.....	5,000
229	Fort Preble, Me., June 1, 1872.....	Major J. G. Chandler, with James & Williams	For 500,000 pounds of anthracite coal, at \$6.24 per ton.....	400
230	Fort Independence.....	Same, with F. H. Smith.....	For 600,000 pounds of anthracite coal, at \$7.49 per ton.....	1,200
231	Fort Warren, June 1, 1872.....	do.....	For 700,000 pounds of anthracite coal, at \$7.44 per ton.....	700
232	Fort Sullivan, Me., June 1, 1872.....	Same, with D. I. Odell.....	For 400 cords of wood, at \$6.19 per cord; 50 cords of wood, at \$3.20 per cord, (kindling.).....	600
233	Fort Preble, Me., June 1, 1872.....	Same, with N. B. Noble.....	For 43,800 pounds of oats, at 70 cents per bushel; 51,100 pounds of hay, at \$34 per ton; 29,664 pounds of straw, at \$24 per ton.....	1,000
234	Fort Warren	Same, with J. E. Staples.....	For 50 cords of wood, at \$10 per cord; 17,520 pounds of oats, at 80 cents per bushel; 20,440 pounds of hay, at \$36 per ton; 21,456 pounds of straw, at \$36 per ton.....	
235	Fort Independence, June 1, 1872	do.....	For 20 cords of wood, at \$9 per cord; 50 cords of wood, at \$10 per cord; 21,900 pounds of oats, at 80 cents per bushel; 25,550 pounds of hay, at \$36 per ton; 22,944 pounds of straw, at \$36 per ton.....	
236	San Francisco, Cal., June 24, 1872.....	Captain G. C. Smith, with N. Bruns	For 2,500,000 pounds of bituminous coal, at \$3.75, coin, per 1,000 pounds	5,000
237	Same, June 21, 1872.....	Same, with Smith & Cutler.....	For dray transportation, at schedule rates.....	5,000
238	Fort Cummings, N. Mex., Sept. 8, 1871.....	Captain A. J. McGonigle, with S. J. Lyons	For 10,000 pounds of bran, at \$2.65 per 100 pounds.....	200
239	Fort Wingate, N. Mex., Sept. 9, 1871	Same, with L. Huning.....	For 35,000 pounds of bran, at \$2.98 per 100 pounds.....	400
240	Yerba Buena Island	Captain G. C. Smith, with D. A. & I. McKinley.....	For 50 cords of wood, at \$7.53, coin, per cord.....	7,000
241	Alcatraz Island.....	do.....	For 200 cords of wood, at \$7.53, coin, per cord.....	
242	Angel Island.....	do.....	For 300 cords of wood, at \$7.53, coin, per cord.....	
243	Point San José	do.....	For 236 cords of wood, at \$7.53, coin, per cord.....	
244	Presidio.....	do.....	For 1,100 cords of wood, at \$7.53, coin, per cord.....	
245	Yerba Buena Island	Same, with R. H. Bennett & Co.....	For 26,000 pounds of hay, at \$6.99 per 1,000 pounds.....	9,000
246	Alcatraz Island.....	do.....	For 30,660 pounds of hay, at \$6.99 per 1,000 pounds.....	
247	Angel Island.....	do.....	For 132,860 pounds of hay, at \$6.99 per 1,000 pounds.....	
248	Presidio.....	do.....	For 750,000 pounds of hay, at \$6.80 per 1,000 pounds.....	
249	Point San José	do.....	For 56,210 pounds of hay, at \$6.99 per 1,000 pounds.....	
250	San Francisco, June 20, 1872	do.....	For 500,000 pounds of hay, at \$6.34 per 1,000 pounds; 430,000 pounds of oats, at \$14.40 per 1,000 pounds.....	
251	Yerba Buena Island.....	Same, with N. Bruns	For 17,000 pounds of barley, at \$13.40 per 1,000 pounds; 14,000 pounds of straw, at \$4.94 per 1,000 pounds.....	6,000
252	Alcatraz Island	do.....	For 25,185 pounds of oats, at \$14.90 per 1,000 pounds	
253	Angel Island.....	do.....	For 94,175 pounds of oats, at \$14.90 per 1,000 pounds	
254	Presidio	do.....	For 608,000 pounds of oats, at \$14.90 per 1,000 pounds	
255	Point San José, June 20, 1872.....	do.....	For 39,420 pounds of oats, at \$14.90 per 1,000 pounds	1,000
256	Alcatraz Island.....	Same, with A. A. Irons	For 50,000 pounds of straw, at \$4.22½ per 1,000 pounds.....	
257	Angel Island.....	do.....	For 60,000 pounds of straw, at \$4.22½ per 1,000 pounds.....	
258	Presidio	do.....	For 225,400 pounds of straw, at \$4.22½ per 1,000 pounds.....	
259	Point San José	do.....	For 16,416 pounds of straw, at \$4.22½ per 1,000 pounds.....	
260	San Francisco, June 20, 1872	do.....	For 150,000 pounds of straw, at \$4.22½ per 1,000 pounds.....	
261	Newberry, S. C., June 30, 1872.....	Lieutenant-Colonel J. A. Ekin, with D. R. Phifer.....	For lease of premises for quarters, &c., at \$86 per month.....	
262	Portland, Oreg., June 26, 1872.....	Major R. Saxton, with R. R. Thompson	For lease of premises for headquarters, at \$525 per mile	500
263	Chicago, Ill., June 26, 1872.....	Captain J. Gilliss, with A. T. Willett.....	For dray transportation, at 5 cents per mile	2,000
264	Omaha, Nebr., June 27, 1872.....	Major A. J. Perry, with J. A. Morran	For 47 cavalry-horses, at \$133 each.....	200
265	Fort Sullivan, Me., June 1, 1872.....	Major J. G. Chandler, with R. Burns	For 24,090 pounds of oats, at 74 cents per bushel.....	100
266	do	Same, with S. B. Hume.....	For 100,000 pounds of anthracite coal, at \$7.49 per ton.....	200
267	do	do.....	For 30,660 pounds of hay, at \$21.50 per ton; 23,712 pounds of straw, at \$15.70 per ton.....	
268	do	Same, with E. Bishop.....		

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
249	Fort Clark, Tex., July 1, 1872	Lieut. Colonel S. B. Holabird, with M. A. Maverick.	For lease of land. (Site of Fort Clark,) at \$50 per month.	.....
250	Camp Supply, Ind. T., June 29, 1872	Major J. M. Moore, with A. E. Reynolds	For 2,600 cords of wood, at \$9.75 per cord	\$5,000
251	Fort Lyon, Col., June 22, 1872	Same, with H. Heaslip	For 951 cords of wood, at \$5.57 per cord; 477 tons of hay, at \$7.09 per ton.	4,000
252	Fort Dodge, Kans., June 23, 1872	Same, with T. F. Rice.	For 484 tons of hay, at \$5.50 per ton	1,500
253	do	Same, with H. C. Lindsey	For 1,200 cords of wood, at \$11.40 per cord.	5,000
254	Fort Larned, Kans., June 24, 1872	Same, with W. W. Jones	For 200 tons of hay, at \$7.34 per ton	800
255	do	Same, with H. P. Wilson	For 650 cords of wood, at \$9.97 per cord; 430 cords of wood, at \$10.97 per cord.	4,000
256	Fort Wallace, Kans., June 27, 1872	Same, with G. Warner	For 509 cords of wood, at \$22 per cord.	4,000
257	Same, June 24, 1872	Same, with S. G. Bridges	For 450 tons of hay, at \$9.90 per ton	3,000
258	Fort Hays, Kans., June 24, 1872	do	For 1,863 tons of hay, at \$10.97 per ton.	8,000
259	Same, June 26, 1872	Same, with E. B. Allen.	For 600 cords of wood, at \$8 per cord	2,000
260	do	Same, with J. R. White	For 1,900 cords of wood, at \$2.43 per cord.	6,000
261	Fort Riley, Kans., June 29, 1872	Same, with M. S. Coplice	For 300 cords of wood, at \$6.17 per cord.	1,000
262	Same, June 20, 1872	Same, with Ed. Lynde	For 1,523 cords of wood, at \$6.45 per cord; 1,007 tons of hay, at \$3.45 per ton.	4,000
263	Fort Leavenworth, Kans., June 24, 1872	Same, with G. F. Earl.	For 3,900 cords of wood, at \$6.79 per cord	5,000
264	Camp Supply, June 29, 1872	Same, with T. Sanderson	For 1,100 tons of hay, at \$9.20 per ton.	3,500
265	Austin, Tex., May 1, 1872	Captain B. C. Card, with G. M. Brass	For 20,000 pounds of corn, at \$1.08 per bushel.	150
266	do	do	For 51,000 pounds of hay, at 19.65 per ton.	200
267	Austin, Tex., May 1, 1872	Captain B. C. Card, with G. M. Brass	For 12,000 pounds of oats, at \$1.35 per bushel	200
268	Fort Clark, Tex., May 1, 1872	Same, with J. P. Alexander	For 1,200 cords of wood—400 at \$1.99; additional quantity at \$2.09 per cord.	800
269	San Antonio, Tex., May 1, 1872	Same, with Dashiell & Penaloza	For 2,000 cords of wood, at \$5.89 per cord.	4,000
270	Fort Concho, Tex., May 1, 1872	Same, with W. Mogford	For 1,200 cords of wood, at \$3.47 per cord.	1,500
271	Fort McKavett, May 1, 1872	Same, with C. Brockmann	For 605,000 pounds of corn, at \$2.08 per bushel.	12,000
272	do	do	For 1,000 bushels of charcoal, at 38 cents per bushel.	150
273	Fort Clark, Tex., May 1, 1872	Same, with J. Cornell	For 725,000 pounds of hay, at \$11.95 per ton.	1,500
274	Fort McIntosh, May 1, 1872	Same, with N. Sanchez	For 190,000 pounds of hay, at \$28 per ton	1,000
275	Fort Still, Ind. T., May 1, 1872	Same, with J. M. Peery	For 189,288 pounds of oats, at \$1.44 per bushel	3,000
276	do	Same, with J. G. Thompson	For 80,000 pounds of oats, at \$1.35 per bushel	1,200
277	Fort Bliss, Tex., May 1, 1872	Same, with J. Lender	For 265,000 pounds of hay, at \$14.94 per ton	7,000
278	Austin, Tex., May 1, 1872	Same, with J. W. Cloud	For 50 cords of wood, at \$7 per cord	125
279	San Antonio, Tex., May 1, 1872	Same, with J. E. Oebse & Co.	For 3,000 bushels of charcoal, at 27 cents per bushel	300
280	Omaha Depot, Nebr., June 10, 1872	Major A. J. Perry, with S. C. Rose	For 500 cords of wood, at \$8.48 per cord.	1,000
281	do	do	For 400 tons of hay, at \$6.44 per ton	1,000
282	do	Same, with S. P. Martin	For 25 tons of straw, at \$6 per ton	1,000
283	do	Same, with H. B. Myers	For 75 tons of straw, at \$6 per ton	1,000
284	Omaha Barracks, Nebr., June 10, 1872	Same, with A. Overton	For 200 cords of wood, at \$9.09 per cord; 300 cords of wood, at \$9.19 per cord; 200 cords of wood, at \$9.29 per cord.	2,000
285	do	Same, with A. P. Flanagan	For 500 cords of wood, at \$9 per cord; 500 cords of wood, at \$9.21 per cord.	2,000
286	do	Same, with S. C. Rose	For 300 tons of hay, at \$5.98 per ton	1,000
287	do	do	For 100 tons of straw, at \$5.50 per ton	1,000

288	do	Same, with C. Childs	For 250 bushels of charcoal, at 32 cents per bushel.	1,000
289	Fort Sanders, June 29, 1872	Same, with W. S. Branel	For 300 cords of wood, at \$5 per cord	1,000
290	do	Same, with E. D. Lane	For 300 tons of hay, at \$9.42 per ton	1,000
291	do	Same, with W. S. Brown	For 1,200 bushels of charcoal, at 33½ cents per bushel	6,000
292	Cheyenne Depot, July 20, 1872	Same, with E. Hook	For 500 tons of hay, at \$17 per ton; 500 tons of hay, at \$17.49 per ton; 500 tons of hay, at \$17.90 per ton; 200 tons of hay, at \$18.25 per ton.	1,000
293	Same, June 29, 1872	Same, with J. R. Whitehead	For 1,000 bushels of charcoal, at 29 cents per bushel	1,000
294	Same, June 20, 1872	do	For 500 cords of wood, at \$7.40 per cord	1,000
295	Sidney Barracks, June 29, 1872	Same, with J. J. Campbell	For 475 cords of wood, at \$9.70 per cord	1,000
296	do	Same, with J. H. Green	For 125 tons of hay, baled, at \$13 per ton; 125 tons of hay, stacked, at \$11 per ton.	1,000
297	do	Same, with D. C. Tracy	For 1,000 bushels of charcoal, at 37 cents per bushel	1,000
298	do	Same, with J. R. Whitehead	For 100 tons of hay, at \$15.90 per ton	1,000
299	Fort D. A. Russell, June 29, 1872	Same, with E. Hook	For 300 tons of hay, at \$15 per ton	1,000
300	do	Same, with J. H. Green	For 400 tons of hay, at \$18 per ton, (baled)	2,000
301	do	Same, with J. R. Whitehead	For 1,000 bushels of charcoal, at 34 cents per bushel	1,000
302	Same, July 20, 1872	do	For 1,000 cords of wood, at \$8.25 per cord	2,000
303	Fort McPherson, June 20, 1872	Same, with E. E. Ericsson	For 500 bushels of charcoal, at 40 cents per bushel	1,000
304	Same, June 29, 1872	Same, with J. H. Green	For 500 bushels of charcoal, at 39 cents per bushel	1,000
305	do	do	For 500 tons of hay, at \$6 per ton, (stacked;) 500 tons of hay, at \$9 per ton, (baled.)	2,000
306	Same, June 20, 1872	Same, with C. McDonald	For 434 cords of wood, at \$7.25 per cord	1,000
307	Same, June 29, 1872	Same, with J. H. Green	For 433 cords of wood, at \$5 per cord; 433 cords of wood, at \$6.50 per cord.	1,000
308	North Platte, Nebr., June 29, 1872	do	For 500 bushels of charcoal, at 49 cents per bushel	1,000
309	do	do	For 125 cords of wood, at \$8 per cord	1,000
310	Same, June 20, 1872	Same, with C. McDonald	For 125 cords of wood, at \$8.90 per cord	1,000
311	do	Same, with L. Walker	For 100 tons of hay, at \$6.75 per ton	1,000
312	Same, June 29, 1872	Same, with J. H. Green	For 100 tons of baled hay, at \$10 per ton	1,000
313	Fort Laramie, Wyo., June 29, 1872	Same, with B. B. Wood	For 700 tons of hay, at \$28.90 per ton	5,000
314	do	Same, with H. Wagner	For 1,600 bushels of charcoal, at 49 cents per bushel	1,000
315	do	do	For 1,800 cords of wood, at \$11.69 per cord	5,000
316	do	Same, with G. Clark	For 200 cords of wood, at \$11.50 per cord	1,000
317	Fort Fetterman, June 29, 1872	Same, with J. Phillips	For 200 tons of hay, at \$23.99 per ton	1,000
318	do	do	For 1,200 bushels of charcoal, at 47 cents per bushel	1,000
319	do	do	For 1,500 cords of wood, at \$9.74½ per cord	3,000
320	Fort Bliss, Tex., May 1, 1872	Captain B. C. Card, with H. Lesinsky	For 155,000 pounds of corn—50,000 pounds at \$1.0304 per bushel; additional quantity at \$1.0752 per bushel.	1,000
321	Fort Quitman, Tex., May 1, 1872	do	For 200,000 pounds of corn—100,000 pounds at \$1.1872 per bushel; additional quantity at \$1.2264 per bushel.	1,500
322	Fort Davis, Tex., May 1, 1872	do	For 340,000 pounds of corn, at \$1.9544 per bushel	4,000
323	Fort Richardson, May 1, 1872	Same, with W. N. McKarny	For 1,820,000 pounds of corn—5,000 bushels at \$2.10 per bushel; additional quantity at \$2.42½ per bushel.	27,000
324	Detroit, Mich., July 1, 1872	Major J. A. Potter, with C. Koch & Co	For 60 cords of wood, at \$6.25 per cord	100
325	Fort Ontario, N. Y., July 1, 1872	Same, with E. M. Fort	For 30,000 pounds of anthracite coal, (stove,) at \$5.50 per ton; 310,000 pounds of anthracite coal, (egg,) at \$5.25 per ton; 100,000 pounds of anthracite coal, (chestnut,) at \$5.25 per ton.	500
326	Fort Niagara, N. Y., July 1, 1872	Same, with J. Marshall	For 20 cords of wood, at \$6.40 per cord; 30,000 pounds of hay, at \$18 per ton; 17,000 pounds of straw, at \$11 per ton.	150
327	Madison Barracks, N. Y., July 8, 1872	Same, with Conlin & Fisher	For 250 cords of wood, at \$5.95 per cord	400

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
328	Madison Barracks, July 9, 1872	Major J. A. Potter, with C. & R. Hall	For 100,000 pounds of stove coal, at \$6.73 per ton; 500,000 pounds of egg coal, at \$6.48 per ton; 200,000 pounds of chestnut coal, at \$6.48 per ton; 35,040 pounds of oats, at 54½ cents per bushel; 40,880 pounds of hay, at \$18 per ton.	\$1,000
329	Fort Niagara, N. Y., July 1, 1872	Same, with W. H. Doyle & Son	For 150,000 pounds of egg coal, at \$7 per ton; 100,000 pounds of chestnut coal, at \$7 per ton.	300
330	Madison Barracks, July 9, 1872	Same, with D. W. McEvoy	For 32,796 pounds of straw, at \$9.50 per ton	50
331	Detroit, Mich., July 1, 1872	Same, with P. W. Nagle	For 250 cords of wood, at \$6.70 per cord	400
332	Fort Ontario, N. Y., July 1, 1872	Same, with J. H. Lee	For 30,000 lbs of hay, at \$20 per ton; 20,000 lbs of straw, at \$15 per ton.	200
333	Fort Gratiot, Mich., July 1, 1872	Same, with M. Plant	For 131 cords of wood, at \$4 per cord	300
334	Fort Mackinac, July 1, 1872	Same, with J. & J. Hoban	For 140 cords of wood, at \$6.74 per cord	250
335	Fort Richardson, Tex., May 1, 1872	Captain B. C. Card, with J. W. Johnson	For 2,000 bushels of charcoal, at 35 cents per bushel	300
336	do	Captain B. C. Card, with M. Wiley	For 3,500,000 pounds of hay, at \$25 per ton	15,000
337	Fort Sill, Ind. T., May 1, 1872	Same, with W. H. H. McCall	For 2,000,000 pounds of hay, 1,000,000 pounds at \$11.55 per ton; additional quantity at \$12.19 per ton.	4,000
338	Hays City, Kans, July 23, 1872	Major J. M. Moore, with S. G. Bridges	For 333,000 pounds of oats, at \$1.63 per 100 pounds; 36,000 pounds of bran, at \$1.55 per hundred pounds.	2,000
339	Fort Larned, Kans., July 23, 1872	do	For 167,000 pounds of oats, at \$1.48 per 100 pounds	1,000
340	Fort Leavenworth, Kans, June 28, 1872	Same, with W. Pemberton	For repairs of quarters of commanding general, at \$1,560	800
341	Fort Larned and Fort Dodge, Kans., July, 17, 1872	Major J. G. Chandler, with A. C. Keever	For 500,000 pounds of corn, at \$1.30 per 100 pounds, and \$1.40 per 100 pounds.	2,500
342	Hays City, Kans., July 16, 1872	Same, with J. McDaniel	For 1,000,000 pounds of corn, at \$1.30 per 100 pounds	4,000
343	Camp Douglas, July 20, 1872	Major A. J. Perry, with E. P. Snow	For 1,000 tons of coal, at \$11 per ton	3,000
344	Fort Bridger, June 29, 1872	Same, with M. M. Turley	For 1,000 bushels of charcoal, at 28 cents per bushel	1,000
345	Fort Sully, Dak., June 12, 1872	Lieutenant-Col. C. H. Tompkins, with J. D. Webb	For 376 tons of hay, at \$12.32 per ton	2,000
346	do	do	For 1,678 cords of wood, at \$4.38 per cord	3,000
347	Fort Shaw, Mont., June 22, 1872	Same, with J. L. Perkins	For 3,098 cords of wood, at \$7.40 per cord	10,000
348	Fort Benton, Mont., June 24, 1872	Same, with J. W. Power	For 60 tons of hay, at \$23.98 per ton	500
349	Fort Ellis, Mont., June 22, 1872	Same, with P. W. McAdow	For 284 tons of straw, at \$9 per ton	1,000
350	Post at Northern Pacific Railroad crossing, June 25, 1872	Same, with C. H. McCarthy	For 1,600 cords of wood, at \$3.85 per cord	2,500
351	Same, June 26, 1872	Same, with L. G. Bennet	For 300 tons of hay, at \$11.99 per ton	2,000
352	Same, June 25, 1872	Same, with N. Myrick	For 200 tons of hay, at \$13 per ton	1,000
353	do	do	For 530 cords of wood, at \$10 per cord	2,000
354	Fort Ellis, Mont., May 29, 1872	Same, with Buford & Thraillkil	For 1,864 cords of wood, at \$5.94 per cord	4,000
355	Fort Randall, Dak., June 4, 1872	Same, with J. Bordeaux	For 53 tons of hay, at \$6.95 per ton	200
356	Fort Shaw, Mont., May 27, 1872	Same, with J. Sargent	For 486 tons of hay, at \$20 per ton	3,000
357	San Francisco, Cal., June 28, 1872	Major C. G. Sawtelle, with H. A. George	For 200 cavalry-horses, at \$108 each	8,000
358	New Orleans, La., July 15, 1872	Captain W. B. Hughes, with J. T. Burdeau	For dray transportation, at schedule rates	4,000
359	New Orleans, La., July 13, 1872	Same, with S. C. Walker	For straw, as required, at New Orleans, at \$27.90 per ton; for oats, 87 cents per bushel; corn, \$1.20 per bushel; hay, \$38 per ton, and straw \$30 per ton, at Aberdeen, Miss.; for hay, \$41 per ton, at Meridian, Miss.; for oats, 79½ cents per bushel; hay, \$36 per ton; straw, \$29 per ton, at Oxford, Miss.; for hay, \$39 per ton, and straw, \$31 per ton, at Baton Rouge, La.; for hay, \$38, and straw, \$30 per ton, at Jackson, Miss., for quantities required.	10,000

360	Same, July 11, 1872.....	Same, with J. H. Hanna.....	For oats, as required, at 65 cents per bushel; corn, 75 cents per bushel; hay, \$35 per ton, at New Orleans; for oats, 67 cents; corn, 80 cents per bushel, and hay, \$37 per ton, at Jackson Barracks; for oats, 84 cents; corn, 88 cents per bushel, at Baton Rouge; for oats, 89 cents; corn, 95 cents, \$1 per bushel, at Jackson, Miss.; for oats, 89 cents; corn, 95 cents, at Meridian, Miss., and corn, \$1.05, at Oxford, Miss., for quantities required.	5,000
361	Same, July 22, 1872.....	Same, with J. A. Spangler.....	For wood, as required, at each of the following posts, viz: New Orleans and Jackson Barracks, at \$7 per cord, and at Aberdeen and Oxford, at \$5 per cord.	2,500
362	do	do	For straw, at Meridian, Miss., at \$35 per ton, as required.....	400
363	Same, July 13, 1872	Same, with A. Everts.....	For wood, as required, at \$4.90, at Little Rock, Ark.....	500
364	Camp Independence, Cal., June 26, 1872.	Lieutenant W. E. Dove, A. A. Q. M., with E. Chaquette.	For 200,000 pounds of hay, at \$25 per ton.....	3,000
365	do	Same, with E. Chaquette.....	For 400 cords of wood, at \$13.95 per cord	5,000
366	do	Same, with Watter & Chapel	For 150,000 pounds of barley, at 3.98 cents per pound	5,000
367	Willet's Point, N. Y., June 28, 1872.....	Major R. N. Batchelder, with F. H. Smith	For 112 cords of wood, at \$7.39 per cord	300
368	Fort Trumbull, Conn., June 18, 1872	Same, with F. & W. Chappell	For 173,279 pounds of stove coal, at \$5.85 per ton; 300,000 pounds of egg coal, at \$5.55 per ton; 100,000 pounds of chestnut coal, at \$5.55 per ton.	400
369	Willet's Point, N. Y., June 18, 1872.....	Same, with Caldwell, Weston & Co	For 1,143,160 pounds of egg coal, at \$5.94 per ton; 280,000 pounds of stove coal, at \$6.24 per ton; 165,000 pounds of nut coal, at \$5.84 per ton; 8,000 pounds of bituminous coal, at \$8.58 per ton.	1,200
370	Plattsburgh Barracks, June 17, 1872.....	Same, with O. McGauley.....	For 50 cords of wood, at \$6.25 per cord	150
371	do	Same, with J. Leonard.....	For 24,176 pounds of oats, at 74 cents per bushel; 26,104 pounds of hay, at \$22.90 per ton; 20,410 pounds of straw, at \$11.99 per ton.	250
372	Same, June 24, 1872	Same, with P. K. Delaney.....	For 672,000 pounds of egg coal, at \$7.55 per ton	700
373	Fort Trumbull, Conn., June 24, 1872	Same, with R. K. Bishop	For 120 cords of wood, at \$6.20 per cord	150
374	Fort Hamilton, N. Y., June 29, 1872.	Same, with T. T. Church.....	For 500,000 pounds of egg coal, at \$5.20 per ton; 800,000 pounds of stove coal, at \$5.40 per ton.	1,500
375	New York City, June 26, 1872.....	Same, with J. W. Hoffman	For 2,000 pounds of corn, at 86 cents per bushel; 23,185 pounds of oats, at 67 cents per bushel; 30,660 pounds of hay, at \$39 per ton, and 110,000 pounds of straw, at \$28 for rye and \$16 for oats, per ton, at Fort Columbus, N. Y.; for 4,380 pounds of oats, at 67 cents per bushel; 5,110 pounds of hay, at \$28 per ton, and 21,648 pounds of straw, at \$28 per ton, at Fort Wood, N. Y.; for 10,000 pounds of corn, at 88 cents per bushel; 380,000 pounds of oats, at 67 cents per bushel; 456,000 pounds of hay, at \$28 per ton, and 156,000 pounds of straw, at \$28 per ton, and 11,000 pounds of bran, at \$1.50 per 100 pounds, at Fort Hamilton, N. Y.; for 51,000 pounds of hay, 41,610 pounds of oats, and 21,216 pounds of straw, at Fort Wadsworth; for 63,600 pounds of oats, at 67 cents per bushel; 59,080 pounds of hay, at \$27 per ton, and 28,000 pounds of straw, at \$28 for rye and \$16 for oat straw, at David's Island; for 27,050 pounds of corn, at 95 cents per bushel; 400,000 pounds of oats, at 75 cents per bushel; 500,780 pounds of hay, at \$31 per ton, and 163,432 pounds of straw, rye at \$31, and oat straw at \$20 per ton, at Fort Adams, R. I.	10,000
376	Same, June 25, 1872.....	Same, with F. H. Smith	For 50 cords of wood, at Fort Wood, and 130 cords at Fort Hamilton, at \$7.39 per cord; 68 cords at Fort Wadsworth, and 50 cords at Fort Adams, at \$6.94 per cord, and 24,280 pounds of oats, at 79 cents per bushel; 30,660 pounds of hay, at \$34.80 per ton; and 16,728 pounds of straw, at \$19.60 per ton, at Fort Trumbull, Conn.	1,200

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
377	New York City, June 26, 1872.....	Major R. N. Batchelder, with J. W. Hoffman	For 32,850 pounds of corn, at 88 cents per bushel; 146,730 pounds of oats, at 67 cents per bushel; 209,510 pounds of hay, at \$27.50 per ton, and 87,936 pounds of straw, at \$28 per ton for rye, and \$16 per ton for oat straw, at Willet's Point, N. Y.	\$2,000 00
378	Same, June 18, 1872.....	Same, with Caldwell, Weston & Co.....	For 1,008,000 pounds of stove coal, at \$5.39 per ton, at Fort Columbus; for 1,856,600 pounds of egg coal, at \$5.09 per ton, at Fort Columbus; for 404,400 pounds of stove coal, at \$5.39 per ton, at Fort Wood; for 777,600 pounds of egg coal, at \$5.09 per ton, at Fort Wood; for 11,200 pounds of bituminous coal, at \$8 per ton, at Fort Wood; for 450,000 pounds of stove coal, at \$5.74 per ton, at Fort Wadsworth; for 144,433 pounds of egg coal, at \$5.44 per ton, at Fort Wadsworth; for 50,000 pounds of nut coal, at \$5 per ton, at Fort Wadsworth; for 430,000 pounds of stove coal, at \$5.95 per ton, at David's Island; for 1,000,000 pounds of egg coal, at \$5.64 per ton, at David's Island; for 1,200,000 pounds of stove coal, at \$6.07 per ton, at Fort Adams, R. I.; for 200,000 pounds of egg coal, at \$5.77 per ton, at Fort Adams, R. I.; for 142,000 pounds of nut coal, at \$5.77 per ton, at Fort Adams, R. I.	3,700 00
379	Jeffersonville, Ind., July 15, 1872.....	Captain C. H. Hoyt, with G. F. Clark	For oats, as required, at 60 cents per bushel; straw, as required, at \$16 per ton.	2,000 00
380	do	Same, with S. C. Walker	For hay, as required, at \$24.45 per ton	2,000 00
381	Same, July 17, 1872.....	Same, with Bradley and Gilbert	For stationery, as required, at schedule rates.....	2,000 00
382	do	Same, with Wilestach, Baldwin & Co.....	For stationery, as required, at schedule prices.....	3,000 00
383	Fort Wadsworth, N. Y., July 13, 1872..	Major R. N. Batchelder, with A. P. Ferris.....	For erection of officers' quarters, at \$8,493	3,000 00
384	Washington, D. C., June 25, 1872.....	Major Wm. Myers, with Solon Fisher & Co	For oats, as required, at 2.3-32 cents per pound; corn, as required, at 1½ cents per pound; hay, as required, at 1.17-20 cents per pound; straw, as required, at 1.7-23 cents per pound.	20,000 00
385	Same, June 29, 1872	Same, with S. W. Jones	For sanitary work, 12 cents per box; 22 cents per load of ashes.....	1,000 00
386	Same, July 1, 1872.....	Same, with C. Worch	For lease of premises for Signal Corps, at \$40 per month.....	.....
387	Same, August 3, 1872	Same, with A. Hyde, agent	For lease of premises for Subsistence Department, at \$600 per annum.	.....
388	Same, July 1, 1872.....	Same, with J. H. Clark.....	For lease of house of Adjutant-General's office, at \$100 per month .....	.....
389	Same, September 6, 1872.....	Same, with J. H. Collins.....	For lease of building for Army Dispensary, at \$100 per month .....	.....
390	Same, June 29, 1872.....	Same, with F. Hollingshead.....	For transportation, by steamer Arrow, between Washington, D. C., and Forts Foote and Washington, Md., at schedule rates.	1,000 00
391	Fort Whipple, Va., July 22, 1872	Major Wm. Myers, with A. Pannell	For construction of buildings, at \$17,197	8,598 50
392	Washington, D. C., June 29, 1872	Same, with W. J. Stephenson & Bro	For wood, as required, (pine,) at \$7 per cord; wood, as required, (kindling,) at \$7.90 per cord; wood, as required, (oak,) \$7.30 per cord; wood, as required, (sawed and split,) at \$8.20 per cord. Coal, (white ash,) at \$6.57 per ton; coal, (red ash,) at \$7.67 per ton; coal, (Lykins Valley,) at \$8.50 per ton; coal, (bituminous,) at \$6.60 per ton.	10,000 00
393	Department of Texas, July 1, 1872	Lieutenant-Colonel S. B. Holabird, with H. B. Adams.....	For transportation on route No. 5, at \$1.06 per 100 pounds per 100 miles.	30,000 00
394	do	do	For transportation on route No. 7, at \$1.86 per 100 pounds per 100 miles.	30,000 00
395	Fort Shaw, Mont., July 22, 1872.....	Lieutenant-Colonel C. H. Tompkins, with A. H. Wilder.....	For 305,231 pounds of oats, at \$3.50 per 100 pounds; 250,481 pounds of barley, at \$3.50 per 100 pounds.	10,000 00

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
427	Charleston, S. C., July 1, 1872.....	Lieutenant-Colonel J. A. Ekin, with G. W. Martin.	For dray transportation, at schedule prices.....	\$1,000
428	Charlotte, N. C., July 31, 1872.....	Same, with R. R. Ray.....	For dray transportation, at schedule prices.....	300
429	Louisville, Ky., July 1, 1872.....	Same, with S. C. Walker.....	For hay, as required, at Columbia, South Carolina, at \$38 per ton; hay, as required, at Unionville, South Carolina, at \$47 per ton; hay, as required, at Yorkville, South Carolina, at \$47 per ton; hay, as required, at Chester, South Carolina, at \$42 per ton; hay, as required, at Lincolnton, North Carolina, at \$43.90 per ton; straw, as required, at Lincolnton, North Carolina, at \$40.90 per ton; hay, as required, at Spartanburgh, South Carolina, at \$48 per ton; straw, as required, at Spartanburgh, South Carolina, at \$46 per ton.	15,000
430	Charleston, S. C., July 1, 1872.....	Same, with J. Armstrong.....	For wood, as required, at \$5 per cord for oak wood; wood, as required, at \$3.50 per cord for pine wood.	1,000
431	Louisville, Ky., July 1, 1872.....	Lieutenant-Colonel J. A. Ekin, with S. C. Walker	For oats, as required, at Atlanta, Georgia, at 62½ cents per bushel; hay, as required, at Atlanta, Georgia, at \$33.95 per ton; oats, as required, at Chattanooga, at 64½ cents per bushel; corn, as required, at Humboldt, at 92 cents per bushel; oats, as required, at Humboldt, at 63 cents per bushel; hay, as required, at Humboldt, at \$32.90 per ton; oats, as required, at Huntsville, at 68½ cents per bushel; straw, as required, at Louisville, at \$13.90 per ton; hay, as required, at Mobile, at \$34.95 per ton; oats, as required, at Nashville, at 58½ cents per bushel; oats, as required, at Paducah, at 66½ cents per bushel; hay, as required, at Paducah, at \$30.95 per ton.	5,000
432	Taylor Barracks and Louisville, Ky., July 1, 1872.....	Same, with Byrne & Speed.....	For bituminous coal, as required, at \$4.90 per ton	3,000
433	Atlanta, Ga., July 1, 1872	Same, with J. J. Thrasher.....	For wood, as required, at \$4.40 per cord	1,000
434	Mobile, Ala., and Mount Vernon, July 1, 1872.....	Same, with B. A. Weems and Co.....	For corn, as required, at \$1 per bushel; oats, as required, at 95 cents per bushel.	800
435	Mobile, Ala., July 1, 1872	Same, with A. C. Danner.....	For wood, as required, at \$6.95 per cord.....	1,200
436	Oglethorpe Barracks and Savannah, Ga., July 1, 1872.....	Same, with J. M. Purse	For coal, (egg,) as required, at \$8.70 per ton; coal, (white ash,) as required, at \$8 per ton; coal, (white ash,) as required, at \$7.75 per ton.	300
437	Fort Pulaski, Ga., July 1, 1872	Same, with W. R. Pritchard, jr.....	For wood, as required, at \$6 per cord	1,500
438	Savannah, Ga., July 1, 1872.....	do	For wood, (pine,) as required, at \$5.50 per cord; wood, (oak,) as required, at \$6 per cord.	500
439	Raleigh, N. C., July 1, 1872.....	Same, with R. H. Page.....	For wood, as required, at \$4.45 per cord.....	600
440	Shelbyville, Ky., July 1, 1872	Same, with Z. C. Andrews	For wood, as required, at \$5.75 per cord; oats, at 62 cents per bushel; hay, at \$22 per ton; and straw, at \$12 per ton.	3,000
441	Newport Barracks, Ky., July 1, 1872.....	Same, with Stevens & Ware.....	For wood, as required, at \$5.40 per cord	500
442	do	Same, with W. M. Mills & Sons	For corn, as required, at 70 cents per bushel; oats, at 60 cents per bushel; hay, at \$23 per ton; and straw, at \$15.	500
443	Lebanon, Ky., July 1, 1872.....	Same, with Cosley & Harris	For hay, (baled,) as required, at \$19 per ton; hay, (loose,) as required, at \$17 per ton.	500
444	Lancaster, Ky., July 1, 1872	Same, with Middleton & Reid	For wood, as required, at \$4.25 per cord	500
445	Mount Sterling, Ky., July 1, 1872	Same, with E. N. McCormick.....	For wood, as required, at \$4.45 per cord	300
446	do	Same, with Cheatham & Tipton	For hay, as required, at \$12 per ton; straw, as required, at \$8 per ton..	200

447	Chester, S. C., July 1, 1872.	Same, with P. Alexander.	For wood, as required, at \$3.75 per cord.	500
448	Columbia, S. C., July 1, 1872.	Same, with Columbia Lumber Company.	For wood, (oak,) as required, at \$4.75 per cord; wood, (pine,) as required, at \$3.90 per cord.	1,000
449	Charlotte, N. C., July 1, 1872.	Same, with R. R. Ray.	For wood, as required, at \$3 per cord.	300
450	Lincolnton, N. C., July 1, 1872.	Same, with C. & W. H. Motz.	For wood, as required, at \$3 per cord.	300
451	Spartanburg, S. C., July 1, 1872.	Lieutenant-Colonel J. A. Ekin, with J. R. Weikert.	For wood, (oak,) as required, at \$2.60 per cord; wood, (pine,) as required, at \$2.40 per cord.	300
452	Huntsville, Ala., July 1, 1872.	Same, with P. H. Wood.	For corn, as required, at 85 cents per bushel.	200
453	Rutherfordton, N. C., July 1, 1872.	Same, with H. C. Carrier.	For wood, (hard,) as required, at \$2.45 per cord; wood, (pine,) as required, at \$1.75 per cord.	300
454	Humboldt, Tenn., July 1, 1872.	Same, with J. M. Mitchell.	For straw, as required, at \$2.4 per ton.	300
455	Elizabethtown, Ky., July 1, 1872.	Same, with J. H. Bryan.	For corn, as required, at 65 cents per bushel; oats, at 50 cents; hay, at \$18 per ton; and straw at \$12 per ton.	3,000
456	do.	do.	For wood, as required, at \$2.75 per cord; coal, (bituminous,) as required, at 14 cents per bushel.	500
457	Humboldt, Tenn., July 1, 1872.	Same, with J. G. Sharp.	For wood, as required at \$2.50 per cord.	300
458	Chattanooga, Tenn., July 1, 1872.	Same, with Hope, Leigh & Co.	For corn, as required, at 85 cents per bushel.	500
459	do.	Same, with P. Maloney.	For wood, as required, at \$3.50 per cord.	300
460	do.	Same, with C. W. Coker.	For coal, as required, at 19 cents per bushel.	500
461	Paducah, Ky., July 1, 1872.	Same, with C. W. Moffatt.	For wood, as required, at \$3 per cord.	300
462	Lexington, Ky., July 1, 1872.	Same, with E. E. Eagle.	For wood, as required, at \$8 per cord; coal, as required, at 31 cents per bushel; straw, as required, at \$15 per ton.	300
463	Nashville, Tenn., July 1, 1872.	Same, with Rhea, Smith & Co.	For corn, at 72 cents per bushel.	800
464	Charleston, S. C., July 1, 1872.	Same, with D. McPherson.	For oats, as required, at 69.24 cents per bushel; straw, as required, at \$26.40 per ton.	20,000
465	Lebanon, Ky., July 1, 1872.	Same, with Corley & Harrison.	For corn in the ear, at 65 cents, shelled 68 cents, and sacked 70 cents per bushel; straw baled at \$12, and loose \$10 per ton.	300
466	Sumter, S. C., July 1, 1872.	Same, with H. H. Moses.	For wood, as required, at \$3.40 per cord.	300
467	Frankfort, Ky., July 1, 1872.	Same, with G. B. Macklin.	For bituminous coal, at 39 cents per bushel.	800
468	Louisville, Ky., July 1, 1872.	Same, with Smith, Sturgeon & Co.	For corn, as required, at Frankfort, Ky., at 80 cents per bushel; oats, as required, at Frankfort, Ky., at 62 cents per bushel; hay, as required, at Frankfort, Ky., at \$26 per ton; straw, as required, at Frankfort, Ky., at \$21 per ton; corn, as required, at Taylor Barracks, Ky., at 70 cents per bushel; oats, as required, at Taylor Barracks, Ky., at 54 cents per bushel; oats, as required, at Lebanon, Ky., at 36 cents per bushel; oats, as required, at Lexington, Ky., at 64 cents per bushel; oats, as required, at Mobile, Ala., at 73 cents per bushel.	3,000
469	do.	Same, with G. F. Clark.	For corn, as required, at Atlanta, Ga., at 98 cents per bushel; hay, as required, at Chattanooga, at \$31 per ton; hay, as required, at Louisville, at \$21.75 per ton; oats, as required, at Mount Sterling, at 60 cents per bushel; straw, as required, at Mobile, Ala., at \$27 per ton; hay, as required, at Mount Vernon, at \$24.90 per ton, and straw, \$34; hay, as required, at Nashville, at \$24.90 per ton; corn, as required, at Paducah, Ky., at 85 cents per bushel, and straw, \$25 per ton; corn, as required, at Shelbyville, at 75 cents per bushel.	3,000
470	Fort Sill, Ind. T., May 1, 1872.	Captain B. C. Card, with Smith & Bro.	For 2,632,000 pounds of corn, at \$1.15 per bushel.	15,000
471	do.	Same, with J. S. Evans.	For 2,000,000 pounds of hay, at \$1.75 per ton.	5,000
472	do.	do.	For 2,000 cords of wood, at \$4.85 per cord.	3,500
473	do.	Same, with T. M. Green.	For 1,325,000 pounds of oats, at \$1.45 6-10 per bushel.	20,000
474	do.	Same, with A. V. Thompson.	For 32,000 pounds of oats, at \$1.29 per bushel.	500
475	Fort Bliss, Tex., May 1, 1872.	Same, with W. B. Blanchard.	For 400 cords of wood, at \$6.50 per cord.	900
476	do.	Same, with A. H. Martin.	For 500 bushel of charcoal, at 50 cents per bushel.	100

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
477	Fort Quitman, Tex., May 1, 1872.	Captain B. C. Card, with J. Moore	For 610,000 pounds of hay, at \$22 per ton	\$2,200
478	do	do	For 400 cords of wood, at \$7.99 per cord	1,000
479	do	do	For 500 bushel of charcoal, at 95 cents per bushel	125
480	Fort McKavitt, Tex., May 1, 1872	Same, with S. Wallack & Co	For 1,600 cords of wood, at \$3.19 per cord	2,000
481	Fort Richardson, Tex., May 1, 1872	Same, with G. W. Howard	For 2,200 cords of wood, at \$4.49 per cord	3,500
482	do	Same, with M. W. Shoemaker	For 910,000 pounds of oats, at \$1.3888 per bushel	13,000
483	Fort Brown, Tex., May 1, 1872	Same, with McAllen & Glaevecke	For 800 cords of wood, at \$2.62½ per cord	800
484	Fort McIntosh, Tex., July 1, 1872	Lieutenant-Colonel S. B. Holabird, with J. E. Ochse	For 300,000 pounds of corn, at \$3.16 per 100 pounds	5,000
485	Fort Davis, Tex., May 1, 1872	Same, with S. R. Miller	For 1,000 bushels of charcoal, at 42½ cents per bushel	250
486	Department of Tex., July 20, 1872	Same, with Kenedy & King	For transportation on route No. 3, at \$1.30 per 100 pounds per 100 miles	30,000
487	do	do	For transportation on route No. 2, at schedule rates	30,000
488	San Francisco, Cal., June 1, 1872	Major C. G. Sawtelle, with Ellis & Co	For transportation to Camp Wright, Cal., at schedule rates	3,000
489	do	Same, with S. Greenebaum	For transportation to Camp Gasten, Cal., at schedule rates	3,000
490	do	Same, with J. S. Rothschild	For transportation to Camp Independence, at schedule rates	3,000
491	do	Same, with B. M. Hartshorn	For transportation to Port Isabel, at \$14 per ton	10,000
492	do	Same, with J. & G. W. Stanley	For transportation from Corinne, Utah, to Fort Hall, Idaho, at \$2.10 per 100 pounds	3,000
493	Detroit, Mich., July 1, 1872	Major J. A. Potter, with P. Brady	For 1,700 pounds of straw, at \$11 per ton, at Fort Gratiot, Mich.; 23,300 pounds of oats, at 63 cents per bushel, at Fort Mackinac; 400,000 pounds of bituminous coal, at \$7.75 per ton, at Fort Brady; 27,000 pounds of oats, at 59 cents per bushel, at Fort Brady; 25,000 pounds of straw, at \$19 per ton, at Fort Brady. For 100,000 pounds of anthracite coal, at \$8.45 per ton, at Detroit; 100,000 pounds of bituminous coal, at \$7.04 per ton, at Detroit; 120,000 pounds of anthracite coal, at \$7.99 per ton, at Fort Wayne. For 500,000 pounds of stove coal, at \$7.70 per ton, at Fort Porter, N. Y.; 296,000 pounds of chestnut coal, at \$7.70 per ton, at Fort Por- ter, N. Y.; 26,280 pounds of oats, at 60 cents per bushel, at Fort Porter, N. Y.; 150,000 pounds of bituminous coal, at \$7.50 per ton, at Fort Niagara; 26,000 pounds of oats, at 60 cents per bushel, at Fort Niagara; 24,000 pounds of oats, at 60 cents per bushel, at Fort Ontario.	300
495	do	Same, with J. Clancy & Co	For 500,000 pounds of stove coal, at \$7.70 per ton, at Fort Porter, N. Y.; 296,000 pounds of chestnut coal, at \$7.70 per ton, at Fort Por- ter, N. Y.; 26,280 pounds of oats, at 60 cents per bushel, at Fort Porter, N. Y.; 150,000 pounds of bituminous coal, at \$7.50 per ton, at Fort Niagara; 26,000 pounds of oats, at 60 cents per bushel, at Fort Niagara; 24,000 pounds of oats, at 60 cents per bushel, at Fort Ontario.	1,200
496	do	Same, with H. Gardiner	For 40 cords of wood, at \$6.90 per cord, at Fort Porter; 100,000 pounds of bituminous coal, at \$6.70 per ton, at Fort Porter; 30,660 pounds of hay, at \$19 per ton, at Fort Porter; 29,664 pounds of straw, at \$14 per ton, at Fort Porter; 100 cords of wood, at \$5.90 per cord, at Fort Ontario.	500
497	Camp Baker, Mont., July 17, 1872	Lieutenant-Colonel C. H. Tompkins, with P. A. Largey.	For 125,677 pounds of oats, at \$2.93 per 100 pounds	2,500
498	Fort Fred Steele, Wyo., August 10, 1872	Major A. J. Perry, with J. F. Coad	For 550 cords of wood, at \$4.50 per cord	1,000
499	Omaha, Nebr., August 22, 1872	Same, with Couch & Fleming	For 100 mules, at \$157 each	4,000
500	Camp McDermit, Nev., June 4, 1872	Lieutenant Thos. T. Knox, A. A. Q. M., with C. Bowling.	For 200 cords of wood, at \$40 per cord; 70 tons of straw, at \$15 per ton.	5,000
501	Same, June 6, 1872	Same, with R. F. James	For 390,915 pounds of barley, at 2.74 cents per pound	5,000
502	Same, July 17, 1872	Same, with Wise & Pease	For hay, as required, at \$21.70 per ton; wood, as required, at \$27 per cord.	5,000

503	Fort McHenry, Md., June 25, 1872	Major A. R. Eddy, with W. Tall	For 600 cords of wood, at \$5.94 per cord	1,500
504	Barrancas, Fla., July 15, 1872	Captain W. B. Hughes, with T. C. Quayle	For wood, as required, at \$4.43 per cord	350
505	Meridian, Miss., July 15, 1872	Same, with A. D. Ladler	For wood, as required, at \$3.50 per cord	250
506	Baton Rouge, La., July 15, 1872	Same, with R. J. McCabe	For wood, as required, at \$4.90 per cord	1,300
507	Jackson, Miss., July 15, 1872	Same, with C. Taylor	For wood, as required, at \$4.47 per cord	800
508	Key West, Fla., July 1, 1872	Same, with M. Acosta	For manning and running United States schooner Matchless, at \$400 per month, after making certain repairs, \$328 per month.	1,000
509	Tucson Depot and Camp Lowell, Ariz., June 1, 1872	Major J. J. Dana, with F. L. Austin	For wood, as required, at \$3.90 per cord	750
510	Portland, Oreg., June 1, 1872	Captain H. W. Janes, with A. J. Brown	For transportation of mails between Camp Bidwell, Cal., and Camp Warner, Oreg., at \$159 per month.	2,000
511	do	Same, with Geo. Flavel	For transportation of mails between Astoria, Oreg., and Forts Cape Disappointment and Stevens, at \$440 per month.	1,500
512	do	Same, with Thomas Coupe	For transportation of mails, troops, &c., between Fort Townsend and Camp San Juan, at \$300 per month.	2,000
513	do	Same, with C. Russell	For transportation of stores between Wallula, Wash., and Fort Lapwai, Idaho, at 4 cents per pound.	2,000
514	do	Same, with A. Martin	For transportation of stores between Fort Klamath and terminus of the Oregon-California Central Railroad, at 5½ cents per pound; during winter months, 30 cents per pound.	3,000
515	Same, June 8, 1872	Major R. Saxton, with W. Grant	For transportation of stores from Dalles to Camp Warner, Oreg., at 8½ cents per pound.	3,000
516	Same, June 13, 1872	do	For transportation of stores from Dalles to Camp Harney, Oreg., at 7 cents per pound.	1,000
517	Camp Stambaugh, January 29, 1872	Major A. J. Perry, with S. Ticknor	For 500 cords of wood, at \$3.50 per cord	1,000
518	do	Same, with J. Holbrook	do	1,000
519	do	Same, with Lamoureux & Noble	For 275 tons hay, at \$32.25 per ton	2,000
520	do	do	For 600 bushels of charcoal, at 24½ cents per bushel	1,000
521	do	Same, with J. Kline	do	1,000
522	Camp Brown, June 29, 1872	Same, with J. Holbrook	For 400 cords of wood, at \$7 per cord	1,000
523	do	Same, with J. W. Anthony	For 70 tons of hay, at \$15 per ton	1,000
524	Fort Bridger, Wyo., June 29, 1872	Same, with E. D. Ralph	For 275 tons of hay, at \$24.45 per ton	2,000
525	Fort Fred Steele, June 29, 1872	Same, with M. Brown	For hay, (stacked,) 220 tons, at \$17.30 per ton; hay, (baled,) 53 tons, at \$19.30 per ton.	1,000
526	Camp Douglas, Utah, June 29, 1872	Same, with W. McCrea	For 400 tons of hay, at \$20 per ton	2,000
527	do	Same, with E. D. Ralph	For 100 tons of straw, at \$13.50 per ton	1,000
528	Same, July 20, 1872	Same, with M. Byrne	For 1,200 cords of wood, at \$11.75 per cord	3,000
529	Fort Fred Steele, August 10, 1872	Same, with E. P. Snow	For 375 tons of coal, at \$8.50 per ton	1,000
530	For Sanders, June 29, 1872	do	For 425 tons of coal, at \$8.85 per ton	1,000
531	Fort D. A. Russell, June 29, 1872	do	For 500 tons of coal, at \$9.90 per ton	1,000
532	Cheyenne Depot, June 29, 1872	do	For 1,175 tons of coal, at \$9.40 per ton	3,000
533	Sidney Barracks, June 29, 1872	do	For 225 tons of coal, at \$10.60 per ton	1,000
534	North Platte, Nebr., June 29, 1872	do	For 125 tons of coal, at \$11.10 per ton	1,000
535	Department of the Platte, July 15, 1872	Same, with M. V. Boughton	For transportation from Bryan to Camps Stambaugh and Brown, Wyo., at schedule rates.	10,000
536	Same, July 24, 1872	Major A. J. Perry, with Clay & McUlvan	For transportation from Cheyenne to Forts Laramie and Fetterman, at schedule rates.	5,000
537	Vancouver Depot, May 22, 1872	Captain H. W. Janes, with J. Crawford	For 2,000 cords of wood, at \$3.19 per cord; 442,000 pounds of oats, at 1.15 cents per pound; 582,000 pounds of hay, at 1.15 cents per pound for baled, and .95 cent per pound for loose; 170,000 pounds of straw, at .65 cents for baled, and .46½ cent for loose, per pound.	6,000
538	do	Same, with Sohns & Bloomfield	For 870 cords of wood, at \$5.45 per cord	1,600

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
539	Vancouver Depot, May 22, 1872	Captain H. W. Jones, with M. Wintler	For 1,200 bushels of charcoal, at 13.5 cents per bushel	\$50 00
540	do	Same, with J. Lee	For 130 cords of wood, at \$4.99 per cord	200 00
541	Camp San Juan Island, May 22, 1872	Same, with T. Coupe	For 46,000 pounds of oats, at 85 cents per bushel of 35 pounds; 62,000 pounds of hay, at \$25 per ton; 33,000 pounds of straw, at \$13 per ton.	700 00
542	Fort Cape Disappointment, May 25, 1872.	Same, with J. W. Case	For 90,000 pounds of hay, at 1 1-11 cents per pound; 25,000 pounds of straw, at 1 1-11 cents per pound.	400 00
543	Fort Stevens, Oreg., May 25, 1872	do	For 60,000 pounds of hay, at 1 1-11 cents per pound; 9,000 pounds of straw, at 1 1-11 cents per pound.	250 00
544	Fort Klamath, Oreg., May 22, 1872	Same, with O. A. Stearns	For 1,000 cords of wood, at \$2.97 per cord	1,000 00
545	do	Same, with J. Ish.	For 800,000 pounds of hay, at \$12.37 per ton; 180,000 pounds of straw, at \$12.37 per ton.	2,000 00
546	do	Same, with W. Hicks	For 1,700 bushels of charcoal, at 25 cents per bushel	150 00
547	do	Same, with A. Martin	For 275,000 pounds of oats, at 5.30 cents per pound	5,000 00
548	Camp Harney, May 22, 1872	Same, with J. N. Clark	For 1,500 cords of wood, at \$8.79 per cord; 800,000 pounds of hay, at \$7.19 per ton; 250,000 pounds of straw, at \$7.19 per ton.	6,000 00
549	do	Same, with B. M. Stoner	For 2,500 bushels of charcoal, at 39 cents per bushel	300 00
550	do	Same, with M. S. Hellman	For 100,000 pounds of oats, at 2.91 cents per pound; 100,000 pounds of barley, at 2.91 cents per pound.	1,500 00
551	Camp Warner, May 22, 1872	Same, with A. Snider	For 1,550 cords of wood, at \$4.35 per cord; 2,500 bushels of charcoal, at 35 cents per bushel; 800,000 pounds of oats or barley, at 3.74 cents per pound.	12,000 00
552	do	Same, with D. R. Jones	For 1,000,000 pounds of hay, at \$34.69 per ton; 300,000 pounds of straw, at \$31 per ton.	8,000 00
553	Fort Lapwai, Idaho, May 25, 1872	Same, with J. Loewenberg	For 300 cords of wood, at \$10.48 per cord; 50,000 pounds of oats, at 2.89 cents per pound; 140,000 pounds of straw, at \$9.98 per ton.	1,500 00
554	do	Same, with W. A. Caldwell	For 50,000 pounds of oats, at 3.48 cents per pound	600 00
555	do	Same, with C. Russell	For 650 cords of wood, at \$11 per cord; 500,000 pounds of hay, at \$19 per ton.	5,500 00
556	do	Same, with A. P. Ankeny	For 500 bushels of charcoal, at 24 cents per bushel; 127,000 pounds of oats, at 3.11 cents per pound.	1,500 00
557	Fort Boise, Idaho, May 22, 1872	Same, with O. Robbins	For 800 cords of wood, at \$7.05 per cord; 100,000 pounds of barley, at \$2.45 per 100 pounds; 200,000 pounds of hay, at \$6.95 per ton; 725 bushels of charcoal, at 28 cents per bushel.	3,500 00
558	Fort Cape Disappointment, June 28, 1872.	Major R. Saxton, with J. W. Case	For 600 cords of wood, at \$5.89 per cord	1,200 00
559	Fort Stevens, Oreg., June 28, 1872	do	For 500 cords of wood, at \$5.89 per cord	1,200 00
560	Portland, Oreg., June 19, 1872	Same, with A. Mallon	For 150 cords of wood, (oak,) at \$6.90 per cord; 20 cords of wood, (pine,) at \$5.17 per cord.	350 00
561	Same, June 13, 1872	Same, with Everding & Beebe	For 130,000 pounds of hay, at 1.27 cents per pound; 30,000 pounds of straw, at .85 cents per pound.	500 00
562	do	Same, with M. Koshland	For 400 tons of coal, at \$15.50 per ton	1,000 00
563	Fort Klamath, Oreg., July 10, 1872	Same, with J. Ish.	For 50,000 pounds of oats, at 5.33 cents per pound	1,000 00
564	Fort Colville, Wash, July 5, 1872	Same, with P. Winans	For 92,000 pounds of oats, at 1.22 cents per pound; 150,000 pounds of hay, at 969-1000 cents per pound; 42,000 pounds of straw, at 429-1000 cents per pound; 1,000 bushels of charcoal, at 22 cents per pound.	1,000 00
565	Department of the Columbia, July 5, 1872.	do	For transportation from Wallula to Fort Colville, Wash., at schedule rates.	2,000 00

566	Same, July 1, 1872.....	Same, with C. Russell.....	For transportation from Wallula to Fort Boise, Idaho, at schedule rates.....	2, 000 00
567	Crab Orchard, Ky., July 1, 1872.....	Lieutenant-Colonel J. A. Ekin, with J. Buchanan.....	For oats as required, at 59 cents per bushel; hay as required, at \$22 per ton, and straw, at \$12.....	500 00
568	Huntville, Ala., July 1, 1872.....	Same, with T. H. Hewlett.....	For wood as required, at \$4.99 per cord; straw as required, at \$20 per ton.....	500 00
569	Fort Macon, N. C., July 1, 1872.....	Same, with W. Thomas.....	For wood as required, at \$3.94 per cord.....	500 00
570	Taylor Barracks, Ky., July 1, 1872.....	Same, with J. Williams.....	For wood as required, at \$4.75 per cord.....	1, 000 00
571	Lebanon, Ky., July 1, 1872.....	Same, with E. B. Fleece.....	For wood as required, at \$3.75 per cord.....	500 00
572	Louisville, Ky., July 1, 1872.....	Same, with J. W. Parmore.....	For hay as required, at \$32 per ton, at Huntsville, Ala.; straw as required, at \$27 per ton, at Atlanta, Ga.; straw as required, at \$17.50 per ton, at Nashville, Tenn.....	1, 500 00
573	Fort Johnston, N. C., July 1, 1872.....	Same, with C. H. Legg.....	For wood as required, at \$4 per cord.....	300 00
574	Unionville, S. C., July 1, 1872.....	Same, with Willey & Powell.....	For wood as required, at \$4.40 per cord.....	500 00
575	Nashville, Tenn., July 1, 1872.....	Same, with J. C. Baker.....	For wood as required, at \$4 per cord.....	500 00
576	Lexington, Ky., July 1, 1872.....	Same, with Gordon & Co.....	For hay as required, at \$20 per ton.....	200 00
577	Newport Barracks, Ky., July 1, 1872.....	Same, with "Newport Ferry Coal Company".....	For coal as required, at 17 cents per bushel.....	600 00
578	Savannah, Ga., July 1, 1872.....	Same, with A. T. Smith.....	For dray transportation at schedule prices.....	500 00
579	Mobile, Ala., August 28, 1872.....	Same, with W. H. Smith.....	For sanitary, at \$19.20 per box per annum.....	500 00
580	Newberry, S. C., August 1, 1872.....	Same, with W. Langford.....	For lease of premises for office of acting assistant quartermaster and acting commissary of subsistence, at \$25 per month.....	.....
581	Springfield, Mo., Jefferson City, Mo., September 30, 1872.....	Captain E. B. Grimes, with J. P. McElroy.....	For coping walls of national cemetery, at \$1.70 per linear foot; coping walls of national cemetery, at \$1.30 per linear foot.....	10, 000 00
582	New York City, September 10, 1872.....	Colonel Rufus Ingalls, with Composite Iron Works Company.....	For iron bunks, as required, at \$6.50 each, (with slats;) iron bunks, as required, at \$5 each, (without slats.).....	10, 000 00
583	Fortress Monroe, Va., June 25, 1872.....	Major A. R. Eddy, with Peters Bros.....	For 116,253 pounds of oats, at 67 cents per bushel; 163,520 pounds of hay, at \$37 per ton; 66,000 pounds of straw, at \$28 per ton.....	2, 000 00
584	Baltimore, Md., June 25, 1872.....	Same, with J. H. Taylor.....	For 23 tons of anthracite coal, at \$8 per ton.....	100 00
585	Fortress Monroe, Va., June 25, 1872.....	Same, with W. Jamison.....	For 359 cords of wood, at \$4.60 per cord.....	500 00
586	Fort McHenry, Md., June 25, 1872.....	Same, with H. N. Richers.....	For 393,910 pounds of oats, at 66½ cents per bushel, and 43,800 pounds of oats, at 66½ cents per bushel, at Baltimore, Md.....	2, 000 00
587	Philadelphia, Pa., June 25, 1872.....	Same, with B. H. Classen.....	For 108,800 pounds of straw, at \$21.80 per ton, at Fort McHenry, Md.; 51,000 pounds of hay, at \$42 per ton, at Baltimore, Md.; 12,000 pounds of straw, at \$24 per ton, at Baltimore, Md.; 238 cords of wood, at \$7.90 per cord, at Baltimore, Md.; 4,040 pounds of corn, at \$1.05 per bushel, at Fort Foote, Md.; 10,000 pounds of oats, at 87 cents per bushel, at Fort Foote, Md.; 15,000 pounds of corn, at \$1.05 per bushel, at Fort Washington, Md.; 27,000 pounds of oats, at 87 cents per bushel, at Fort Washington, Md.....	2, 500 00
588	Fortress Monroe, Va., Fort McHenry, Md., June 25, 1872.....	Same, with F. H. Smith.....	For 16,242 pounds of corn, at 89 cents per bushel; 464,560 pounds of hay, at \$38.80 per ton.....	4, 000 00
589	Fort Foote, Md., and Fort Washington, Md., June 25, 1872.....	Same, with Suttle & Stuart.....	For 50 cords of wood, at \$8 per cord, at Fort Foote; 20,160 pounds of hay, at \$49.60 per ton, at Fort Foote; 13,592 pounds of straw, at \$32 per ton, at Fort Foote; 25 cords of wood, at \$8 per cord, at Fort Washington; 47,000 pounds of hay, at \$49.60 per ton, at Fort Washington; 10,000 pounds of straw, at \$32 per ton, at Fort Washington.....	500 00
590	Ringgold Barracks, Tex., May 1, 1872.....	Captain B. C. Card, with H. Chamberlain, jr.....	For 600 cords of wood, at \$3.18 per cord.....	600 00
591	do.....	do.....	For 315,000 pounds of hay, at \$21.43 per ton.....	1, 100 00
592	do.....	do.....	For 500 bushels of charcoal, at 39 cents per bushel.....	65 00
593	Fort Brown, Tex., May 1, 1872.....	do.....	For 40,000 pounds of hay, at \$39.75 per ton.....	250 00
594	Philadelphia, Pa., June 28, 1872.....	Colonel L. C. Easton, with T. Brack & Co.....	For 25 cords of kindling-wood, at \$14.50 per cord.....	362 50
595	do.....	Same, with Audenried, Norton, & Co.....	For anthracite coal, 5,000 tons, at \$4.19 per ton, delivered on vessels; delivered at residences of officers, at \$5.19 per ton.....	25, 000 00

Abstract of contracts made by the Quartermaster's Department during the year ended December 31, 1872, &c.—Continued.

No.	Place and date.	Parties.	Nature of contract.	Bond.
596	Philadelphia, Pa., October 1, 1872.....	Colonel L. C. Easton, with W. J. Crawford.....	For dray transportation, at schedule prices.....	\$1,500
597	Same, June 28, 1872.....	Same, with Bunn & Bro.....	For 6,000 bushels of oats, at 63½ cents per bushel; 70 bushels of corn, at 75 cents per bushel; 230,000 pounds of hay, at \$2.05 per 100 pounds; 54,000 pounds of straw, at \$1.50 per 100 pounds.	10,000
598	Fort Stockton, Tex., July 1, 1872.....	Lieutenant-Colonel S. B. Holabird, with G. M. Frazer.	For 500,000 pounds of hay, 50 tons, at \$12.20 per ton; 100 tons, at \$13.94 per ton. Additional quantity, at \$14.67 per ton.	1,200
599	Department of Texas, July 1, 1872.....	Same, with J. Waldo, agent H. & T. Central Railroad Company.	For transportation on route No. 6, part 2, at schedule rates.....	10,000
600	do.....	Same, with C. A. Whitney & Co.....	For transportation on route No. 1, at schedule rates.....	30,000
601	Fort Hall, Idaho, July 1, 1872.....	Lieutenant J. S. King, A. A. Q. M., with W. McCrea.	For 100,000 pounds of barley, at 4½ cents per pound; 100,000 pounds of oats, at 4½ cents per pound; 290,000 pounds of hay, at 7-10 cents per pound; 75,000 pounds of straw, at 7-10 cents per pound; 700 cords of wood, at \$10.50 per cord.	18,000
602	Detroit, Mich., July 1, 1872.....	Major J. A. Potter, with H. Gardiner.....	For 160,000 pounds of oats, at 49 cents per bushel, at Detroit; 185,000 pounds of hay, at \$17 per ton, at Detroit; 45,000 pounds of straw, at \$10 per ton, at Detroit; 775 cords of wood, at \$5.94 per cord, at Fort Wayne; 250,000 pounds of bituminous coal, at \$6.70 per ton, at Fort Wayne; 73,375 pounds of oats, at 49 cents per bushel, at Fort Wayne; 86,870 pounds of hay, at \$17 per ton, at Fort Wayne; 55,000 pounds of straw, at \$10 per ton, at Fort Wayne; 287,000 pounds of anthracite coal, at \$2.48 per ton, at Fort Gratiot; 25,000 pounds of oats, at 48 cents per bushel, at Fort Gratiot; 30,700 pounds of hay, at \$15.90 per ton, at Fort Gratiot; 150,000 pounds of anthracite coal, at \$11.74 per ton, at Fort Mackinac; 29,927 pounds of hay, at \$24.50 per ton, at Fort Mackinac; 16,021 pounds of straw, at \$20 per ton, at Fort Mackinac; 735,000 pounds of anthracite coal, at 10.75 per ton, at Fort Brady; 31,000 pounds of hay, at \$23.40 per ton, at Fort Brady.	1,200
603	Camp Wright, Col., May 14, 1872.....	Lieutenant J. Holloran, A. A. Q. M., with H. S. Lovell.	For 160 cords of wood, at \$3.74 per cord; 160 cords of wood, at \$3.49 per cord.	1,000
604	Same, May 13, 1872.....	Same, with G. W. Henley.....	For 40,000 pounds of barley, at 2 cents per pound; 62,000 pounds of hay, at 4 cents per pound; 24,000 pounds of straw, at \$12 per ton.	1,000
605	San Francisco, Cal., June 13, 1872.....	Major C. G. Sawtelle, with Whitney & Co.....	For transportation between Reno, Nev., and Camp Bidwell, Cal., at \$6.10, L. T., per 100 pounds.	3,000
606	Same, June 25, 1872.....	do.....	For transportation between Reno, Nev., and Camp Warner, Oreg., at \$7.50, L. T., per 100 pounds.	7,000
607	Camp Date Creek, Ariz., June 1, 1872...	Major J. J. Dana, with G. H. Kimball.....	For wood, as required, at \$11.96 per cord.....	2,100
608	Tucson Depot, Ariz., Camp Bowie, Ariz., June 1, 1872	Same, with P. R. Tully.....	For hay, as required, at \$11.98 per ton; wood, as required, at \$12.13 per cord.	3,000
609	Camp Hualpai, Whipple Depot, June 1, 1872.	Same, with E. Puntenev.....	For hay, as required, at \$28 per ton; hay, as required, at \$34 per ton....	6,000
610	Camp Beale's Springs, June 1, 1872.....	Same, with A. J. Moore.....	For hay, as required, at \$36 per ton.....	600
611	Camp Date Creek, June 1, 1872.....	Same, with J. C. Beatty.....	For hay, as required, at \$24.98 per ton.....	3,000
612	Camp Mohave, June 1, 1872.....	Same, with P. Brown.....	For hay, as required, at \$41.60 per ton.....	1,600
613	Camp Verde, June 1, 1872.....	Same, with C. C. Bean.....	For hay, as required, at \$23 per ton.....	1,500
614	Knoxville, Tenn.....	Lieutenant-Colonel J. A. Ekin, with Bearden & Patterson.	For building wall around national cemetery, at \$4.55 per linear foot, and for iron gates, \$225.	3,000

615	West Point, N. Y., October 31, 1872.....	Lieutenant J. M. Marshall, A. A. Q. M., with C. B. Bishop.....	For 10,000 bushels of oats, at 49 cents per bushel.....	\$1, 633
616	do.....	Same, with J. Caldwell.....	For 200 tons of hay, at \$28 per ton; 30 tons of straw, at \$16 per ton.....	2, 030
617	Camp Gaston, Cal., July 10, 1872.....	Lieutenant G. W. Kingsbury, A. A. Q. M., with John Laf.....	For 78,000 pounds of oats, at 4½ cents per pound; 125,000 pounds of hay, at 3 cents per pound.....	7, 000
618	do.....	Same, with F. Colegrove.....	For 600 cords of wood, at \$7.50 per cord.....	4, 000
619	Jeffersonville, Ind., September 24, 1872.....	Captain C. H. Hoyt, with Armstrong & Co.....	For 5,000 bushels of bituminous coal, at 17½ cents per bushel.....	1, 000
620	Fort Gibson, Ind. T., October 30, 1872.....	Major Jas. Belger, with J. G. Fawcett.....	For transferring the remains of deceased officers and soldiers from Washita and Arbuckle to Fort Gibson national cemetery, at \$9.40 each.....	2, 500
621	Omaha, Nebr., Oct., 10, 1872.....	Major A. J. Perry, with A. Finney.....	For 400 cavalry horses, at \$120 each.....	10, 000
622	Fort Dodge, Kans., October 22, 1872.....	Major J. G. Chandler, with T. Thompson.....	For 580,000 pounds of corn, at \$1.33 per 100 pounds.....	2, 500
623	Chicago, Ill., October 21, 1872.....	Captain Jas. Gillies, with D. R. Pearsons.....	For lease of premises for Subsistence Department, at \$100 per month.....	.....
624	Fort Ellis, Mont., September 12, 1872.....	Lieutenant-Colonel H. C. Ransom, with N. J. Malin.....	For 774,833 pounds of oats, at \$1.92 per 100 pounds; 774,833 pounds of barley, at \$1.92 per 100 pounds.....	10, 000
625	Chattanooga, Tenn., July 1, 1872.....	Lieutenant-Colonel J. A. Ekin, with C. W. Coker.....	For straw, as required, at \$20 per ton.....	500
626	Charleston, S. C., July 1, 1872.....	Same, with C. A. Eccleston.....	For hay, as required, at \$34.50 per ton.....	3, 000
627	Fort Wingate, N. Mex., September 30, 1872.....	Lieutenant-Colonel Fred. Myers, with S. Bibb.....	For 375 tons of hay, at \$21.89 per ton.....	3, 000
628	Santa Fé, N. Mex., September 3, 1872.....	Same, with Holmes & Sweeney.....	For 1,200 bushels of charcoal, at 24 cents per bushel.....	200
629	Same, September 5, 1872.....	Same, with B. Seligman.....	For 225 tons of hay, at \$28.92 per ton.....	2, 000
630	do.....	do.....	For 500 cords of wood, at \$4.82½ per cord; 500 cords of wood, at \$5.07½ per cord.....	2, 000
631	Fort Stanton, N. Mex., October 1, 1872.....	Same, with L. G. Murphy.....	For 150 tons of grama hay, at \$24.90 per ton; 100 tons of bottom hay, at \$18.00 per ton.....	2, 000
632	Fort Selden, N. Mex., September 30, 1872.....	Same, with H. C. Haring.....	For 1,500 bushels of charcoal, at 34 cents per bushel.....	500
633	do.....	do.....	For 100 tons of hay, at \$9.93 per ton.....	2, 000
634	do.....	Same, with P. Serna.....	For 350 cords of wood, at \$5.85 per cord.....	1, 000
635	Fort Bayard, N. Mex., September 30, 1872.....	Same, with W. Grant.....	For 2,000 bushels of charcoal, at 31 cents per bushel.....	300
636	Same, September 28, 1872.....	Same, with R. Hudson.....	For 250 tons of hay, at \$27.50 per ton.....	3, 000
637	Same, September 30, 1872.....	Same, with Miller & Knox.....	For 800 cords of wood, at \$3.90 per cord.....	1, 500
638	do.....	Same, with R. V. Newsham.....	For 100 tons of hay, at \$18 per ton; 100 tons of hay, at \$20 per ton.....	2, 000
639	Fort Craig, N. Mex., September 24, 1872.....	Same, with J. M. Shaw.....	For 150 tons of hay, at \$8.75 per ton.....	1, 000
640	Same, September 30, 1872.....	Same, with N. Raymond.....	For 200 cords of wood, at \$4.74 per cord.....	500
641	do.....	Same, with J. Pino Y Baca.....	For 1,500 bushels of charcoal, at 39 cents per bushel.....	300
642	Fort Tulerosa, N. Mex., September 22, 1872.....	Same, with J. J. Garcia.....	For 120 tons of hay, at \$18.90 per ton.....	1, 000
643	Same, October 2, 1872.....	Same, with M. Vigil.....	For 150 tons of hay, at \$20.37 per ton.....	1, 500
644	Same, September 30, 1872.....	Same, with R. Tafolla.....	For 1,500 bushels of charcoal, at 28 cents per bushel.....	300
645	Fort Union Depot, N. Mex., September 30, 1872.....	Same, with D. Valdez.....	For 2,250 cords of wood, at \$3.50 per cord.....	5, 000
646	do.....	Same, with J. B. Watrous.....	For 4,000 bushels of charcoal, at 22½ cents per bushel.....	500
647	do.....	Same, with C. W. Kartes.....	For 250 cords of wood, at \$9.85 per cord.....	1, 000
648	Same, October 1, 1872.....	Same, with Ames & Bryant.....	For 250 tons of hay, at \$14.39 per ton.....	2, 000
649	Same, September 30, 1872.....	Same, with J. B. Watrous.....	For 100 tons of hay, at \$14 per ton.....	1, 000
650	Same, October 7, 1872.....	Same, with D. Valdez.....	For 250 tons of hay, at \$14.50 per ton.....	2, 000
651	Same, October 1, 1872.....	Same, with C. Traker.....	For 150 tons of hay, at \$14 per ton.....	1, 000

Official :

QUARTERMASTER GENERAL'S OFFICE, January 6, 1873.

M. C. MEIGS, Quartermaster General, Brevet Major-General, U. S. A.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL-OFFICER,
Washington, D. C., January 16, 1873.

SIR: In pursuance of the act of Congress approved April 21, 1808, and in compliance with requirements of Mis. Doc. No. 1, Forty-second Congress, third session, I have the honor to report that, during the year 1871, the only contract entered into by this office was with Stephen H. Condict, of the city of New York, for signal equipments, which was duly executed in accordance with provisions of same.

Very respectfully, your obedient servant,

ALBERT J. MYER,
Brigadier-General and Chief Signal-Officer of the Army.

The Hon. the SECRETARY OF WAR,
Washington, D. C.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL-OFFICER,
Washington, D. C., January 17, 1873.

SIR: In compliance with requirements of an act of Congress approved April 21, 1808, I have the honor to report that there were no contracts entered into by this office during the year ending December 31, 1872.

Very respectfully, your obedient servant,

ALBERT J. MYER,
Brigadier-General and Chief Signal Officer of the Army.

The Hon. the SECRETARY OF WAR,
Washington, D. C.

BANKING FACILITIES BETWEEN THE UNITED STATES AND
CHINA.

LETTER

FROM

THE SECRETARY OF STATE,

INCLOSING

A communication from the consul at Hong-Kong, China, in relation to the manner of transacting business between citizens of the United States and the East, with a letter from the Secretary of the Treasury on the same subject.

JANUARY 30, 1873.—Referred to the Committee on Foreign Affairs and ordered to be printed.

DEPARTMENT OF STATE,
Washington, January 25, 1873.

SIR: I have the honor to lay before you a copy of dispatch No. 152, from Mr. David H. Bailey, the consul of the United States at Hong Kong, on the subject of the necessity for greater banking facilities between the United States and the East, and also a copy of a letter addressed to this Department by the Secretary of the Treasury, to whom the dispatch was referred.

Should you concur in the recommendation made in the letter of the Secretary of the Treasury, with regard to the publication of the dispatch, it is suggested that it be submitted to the House of Representatives in order to be printed.

I have the honor to be, sir, your obedient servant,
HAMILTON FISH.

Hon. N. P. BANKS,
House of Representatives.

Inclosures.

1. Mr. Bailey to Mr. Hale—No. 152—dated October 10, 1872.
2. Mr. Boutwell to Mr. Fish, January 23, 1873.

No. 152.]

UNITED STATES CONSULATE,
Hong-Kong, October 10, 1872.

SIR: I have the honor to submit the following suggestions for such action or reference as the Department may think proper.

For some time my attention has been drawn to the importance of closer and more direct banking facilities between the United States and China. The great and rapidly augmenting trade between the two countries would seem to demand new and cheaper channels for the immense sums of money floating to and fro. In other words, more direct and economical facilities, by which the benefit of direct exchange and its lower rate would accrue more directly to Americans and to those engaged in commerce between Eastern Asia and the United States.

As a natural consequence of such an improvement, a certain percentage would be saved, by which goods could be laid down in America cheaper than under the course pursued now. If this percentage be only a trifle, the total will show a heavy sum in the end.

At present, all the vast sums of money passing between America and Asia are paying enormous tribute to London.

San Francisco, Shanghai and Hong-Kong, facing each other on opposite shores of the Pacific, go round the world to pay each other in Lombard street; an anomaly which it seems to me need not be, and which can and ought to be abrogated.

It is a well-known fact that the balance of trade between America and Europe (England largely predominating) is usually against the former. This deficit is made up by both North and South America sending bullion and specie to Europe. The United States imports from China, Japan, the Philippine Islands, and East India, annually, to the extent of about (approximately) \$50,000,000, (Mexican money.) By far the greatest portion of this import is paid for by America in London. Thus the United States annually adds to the debts already existing against her in Europe the amount of her imports from the East. For attending to this financiering of our commerce in the East, London banks and bankers charge, as commission, 2 per cent. on the amount drawn. The English banks in the East have, say, $\frac{1}{2}$ per cent. profit on the transaction for negotiating the paper.

Sometimes it is much greater if fluctuations in bullion and exchange are favorable. The same silver and dollars that are sent from America to England, as a rule, are forwarded from London to India and China, to cover the deficit of the English importations into these countries against the exports; and thus this bullion and specie is burdened by additional freight, insurance, and interest, before reaching its destination, by the circumlocution route via England, instead of coming direct from California.

We have thus: 2 per cent. London banking commission; $\frac{1}{2}$ per cent. to 1 per cent. profit or charges of the banks in China and India; $\frac{1}{2}$ per cent. to 1 per cent., at least, additional expense on treasure; say from 3 to 4 per cent., at the very lowest, which our importers and consumers of eastern produce pay to England for negotiating American bills drawn in China, India, &c., on London. I think, however, that, on an average, 4 per cent. is nearer the mark than 3.

If England were at any time in debt to America it would be natural enough for her to pay our debts in the East, but the reverse being the case, why should America pay a tax of 4 per cent. on her large eastern commerce? Simply because it is the way in which the business has been done for years; and American financiers and business men have not yet realized the change that can and will be effected through the opening of steam communication between California and Asia, and thence to India, and further, because those who have been holding the monopoly so long are straining every nerve to retain it. With steamers running across the Pacific, our railroads spanning the con-

continent, and cables uniting America and Asia, there is no longer any necessity for England acting as America's financial agent in the East.

If a banking profit has to be made on exports to the United States, American banks and bankers can and ought to make it, and do the business more cheaply than it can be done by way of London.

In case of a war between England and the United States the trade of the latter with the East, though conveyances be plentiful, would of a sudden be stopped, as English credits would be wanting, a most serious though remote consideration.

So far, a direct exchange business between China and America by drafts on New York or San Francisco has been quite insignificant. One or two banks are buying such paper, but with considerable restrictions, and at rates only which are on a par with sterling, therefore affording no saving to the drawer. Direct credits on New York, to be availed of in the East, are refused by the principal banking-houses at New York with headquarters in London.

The plan that suggests itself is for a powerful American bank or company of bankers to establish branches at all the chief places of trade in the East, and issue credits and buy drafts direct on New York, San Francisco, and other centers, and thereby get the control of the American-Asiatic trade. The scheme is natural and legitimate, and everything that is natural and legitimate is, as a rule, successful. There is no saying that the time may not come when the stream of bullion and dollars, now leaving Mexico, Peru, and other South American countries, will flow into one great reservoir, one of the great commercial centers of the United States, whether it be New York or San Francisco, and that there the balances of the whole world will be adjusted.

As a corollary to the banking or exchange question, I may suggest the great importance of a coinage by the Government to meet the requirements of the Asiatic trade, or more especially that of China. Permit me to express the opinion that—

1. A dollar of the same intrinsic value as the Mexican, to serve for currency in China, should be coined by the United States.

2. A sufficient quantity of these dollars should be shipped on trial, and, if possible, a declaration obtained from the Peking government, declaring them a legal tender in all trade transactions, and for payment of custom-house dues, and forbidding their being *chopped*.

3. The dollars to be, once for all, of a uniform coinage, and as closely resembling the Mexican dollar as may be expedient.

If, as it may be supposed, the scheme is successful, gold coin will soon follow, and instead of America shipping her gold and silver in bars to Europe, she will find a vast market for her coins in the East, and get, thereby, an enormous hold on this great trade.

I have the honor to be, sir, your obedient servant,

DAVID H. BAILEY,
United States Consul.

Hon. CHARLES HALE,
Assistant Secretary of State, Washington, D. C.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
January 23, 1873.

SIR: I have the honor to acknowledge the receipt of your communication of the 13th instant, covering the dispatch of Mr. D. H. Bailey,

consul at Hong-Kong, under date of October 10, in which he discusses the necessity of greater banking facilities between the United States and the East.

The views presented by Mr. Bailey are of great importance; but of the suggestions made by him there is only one—that relating to the coinage of silver dollar equal in value to the Mexican dollar—that can be acted upon by the Government. In respect to this I am happy to be able to say that, upon a recommendation made by this Department, a provision is incorporated in the mint bill, now pending in conference committee of the two Houses of Congress, authorizing the issue of silver coin of a value quite equal to the Mexican dollar, and designed for use in the trade between this country and China.

Allow me to suggest that the publication of Mr. Bailey's dispatch, by calling the attention of bankers to the subject, might lead to a course of business on their part which would result in securing to this country the advantages so clearly set forth by him.

The dispatch, No. 152, is herewith returned.

Very respectfully,

GEO. S. BOUTWELL,
Secretary.

Hon. HAMILTON FISH,
Secretary of State.

○

APPOINTMENT OF CLERKS IN THE STATE DEPARTMENT.

LETTER

FROM

THE SECRETARY OF STATE,

RELATIVE TO

The appointment of clerks in his Department during the year 1872.

JANUARY 31, 1873.—Referred to the Committee on Civil Service and ordered to be printed.

DEPARTMENT OF STATE,
Washington, January 27, 1873.

SIR: In compliance with the resolution of the House of Representatives of the 18th instant, requesting information in regard to the appointment of clerks in this Department during the year 1872, I have the honor to state that the appointment of John Davis, of Massachusetts, is the only appointment of a clerk made in the Department of State during the year above mentioned. The appointment was made under the operation of the civil-service regulations.

I have the honor to be, sir, your obedient servant,
HAMILTON FISH.

Hon. JAMES G. BLAINE,
Speaker of the House of Representatives.

THE STATE OF TEXAS,
COUNTY OF DALLAS.

I, the undersigned, Clerk of the County of Dallas, do hereby certify that the within and foregoing is a true and correct copy of the original as the same appears in the records of the County of Dallas.

IN WITNESS WHEREOF, I have hereunto set my hand and the seal of the County of Dallas, this _____ day of _____, 19____.

CLERK OF THE COUNTY OF DALLAS.

Subscribed and sworn to before me this _____ day of _____, 19____.

Notary Public for the State of Texas.

My Comm. Expires _____

Notary Public for the State of Texas.

My Comm. Expires _____

Notary Public for the State of Texas.

FREEDMEN'S HOSPITAL IN DISTRICT OF COLUMBIA.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The condition of the Freedmen's Hospital in the District of Columbia.

JANUARY 31, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT, *January 29, 1873.*

The Secretary of War has the honor to transmit to the House of Representatives, in compliance with the resolution of the 24th instant, copies of the report of Surgeon-General J. K. Barnes and Inspector-General Edward Schriver relative to the condition of the Freedmen's Hospital in the District of Columbia.

Assistant-Surgeon Billings has never made, or been called on to make, a report in relation to that institution.

WM. W. BELKNAP,
Secretary of War.

REPORT ON RENT OF FREEDMEN'S HOSPITAL.

SURGEON-GENERAL'S OFFICE,
July 13, 1872.

Respectfully returned to the Hon. Secretary of War. A careful inspection of the premises shows that the Freedmen's Hospital is in joint occupancy by the United States and the Howard University, which cannot be terminated without injury to both the hospital and the university. The main building is, in reality, the medical college of the university, containing its lecture, operating, and dissecting-rooms, laboratory, and offices for professors, in addition to the rooms on the first and second floors, occupied for hospital purposes. As the water-supply, heating, and lighting of this building cannot be separated from the general system of expenditure for the entire hospital, it is considered that the cost for water-supply, heating, and lighting the entire building is a full equivalent of rent for the portion of it occupied for hospital purposes.

The three wards now occupied, with the kitchen, laundry, engine-house, and out-buildings, and the new ward not yet completed, are

frame structures of an inexpensive and temporary character, for the occupancy of which, with all the privileges and appurtenances heretofore included, a yearly rent of two thousand dollars is considered ample and liberal.

Outside of the inclosure are other buildings belonging to the Howard University, in part occupied by indigent colored people, by old women and children, who draw rations from the hospital, but are not patients. Rent for the buildings and rooms so occupied has hitherto been paid by the commissioner of freedmen to the Howard University from the appropriation for the support of the hospital, exclusive of rent for hospital; but as all these buildings were erected at Government expense, it is respectfully recommended that no rent for them be paid after July 1, 1872, and that the issue of rations from the hospital be only continued as a matter of necessity, and in cases of absolute need.

J. K. BARNES,
Surgeon-General.

SURGEON-GENERAL'S OFFICE,
January 28, 1873.

A true copy:

C. H. CRANE,
Assistant Surgeon-General, United States Army.

The rent for the buildings occupied by the Freedmen's Hospital, as fixed by the honorable Secretary of War, was \$2,000 per annum,—not \$1,000, as stated by General Howard,—this valuation being made after careful inspection by the Surgeon-General and by Inspector-General Schriver.

In addition to this, the appropriation for the support of the Freedmen's Hospital bears all the expense of heating and lighting the Howard Medical University—the only expensive and permanent structure of those rented, and of which but a very small portion is available for hospital use.

In carrying out the order of the Secretary of War the Surgeon-General has been very careful not to decrease or interfere with the educational features of the hospital, and the professors are in full enjoyment of their usual facilities.

Under former act of Congress the Freedmen's Bureau was authorized to devote certain property to educational purposes, but the appropriation for the Freedmen's hospital and asylum conveys no such power.

It is not thought that this appropriation will materially exceed expenditures for the current fiscal year; but even if it should, the support of the Howard University cannot be considered legitimately chargeable to it; and, so far as the welfare of the inmates is concerned, it appears highly desirable that the cost of their support and treatment should be kept at a minimum, thus affording the assurance to Congress that future appropriation need not be excessive, and will be strictly devoted to the purposes designated.

Very respectfully, your obedient servant,

J. K. BARNES,
Surgeon-General.

SURGEON-GENERAL'S OFFICE,
January 28, 1873.

A true copy:

C. H. CRANE,
Assistant Surgeon-General, United States Army.

WAR DEPARTMENT, WASHINGTON CITY,
July 1, 1872.

In accordance with the Judge-Advocate-General's recommendation, the case was referred to the commissioner of freedmen, who made the following statement, to which some explanatory remarks, derived from the records of the "Howard investigation" by the House of Representatives, have been added.

A portion of the land, including an old building thereon, (marked B on the accompanying plat,) on which the hospital is, was purchased from Geo. W. Balloch, "trustee of retained bounty fund," by the Howard University, for six thousand dollars. The deed bears date of "June 30, 1869." (See page 284 of vol. "Howard Investigation.") Balloch says he paid J. A. Smith twelve thousand dollars (\$12,000) for the property, and gives as a reason for selling it for half that sum to the Howard University that he received in rents for the property, and in interest on the bonds in which the fund is invested, enough to make up the balance, feeling perfectly justified in doing so in view of "the unfortunate class benefited."

The rents referred to were paid by the Freedmen's Bureau, at the rate of \$1,200 a year, to the trustee of the fund, Balloch. For the origin of this fund see Balloch's statement at page 283 of vol.

Another portion of land adjacent to the above, including a brick building standing thereon (C,) was purchased for seven thousand dollars by the Howard University from Beckert. (See page 283 of vol.)

On these two pieces of land five additional buildings were erected by the commissioner of freedmen from appropriations, directly and indirectly, by Congress, for educational purposes, and for asylums for relief.

On 5th November, 1868, the commissioner asked Secretary of War, Schofield, for authority to transfer buildings to association on whose land they stood, in consideration of a formal guarantee that such buildings, or the proceeds of their rental or sale, shall be donated perpetually to educational purposes, irrespective of the race or color of the pupils. (See page 499 of vol.)

The Judge-Advocate-General, to whom the subject was referred for opinion as to the authority of law for such proposed transfer, gave that at page 500 of vol.

On the 11th November, 1868, with Secretary Schofield's approval, the commissioner issued a circular in conformity to said opinion, (see page 500 of vol. ;) but on the 23d December, 1868, the Secretary ordered an exception to be made in the case of the "Howard College," (University.) (See page 501.)

On September 1, 1869, Secretary of War Rawlins authorized the commissioner to treat buildings in the District of Columbia like those erected in other districts, and, accordingly, the "exception" being removed, on the 30th September, 1869, all the buildings then erected by the Freedmen's Bureau, or carried on its property returns, situated on lots on which is the hospital in question, described as embraced in square 640, (see pages 501-502,) were transferred to the Howard University, to which an annual rent of five thousand dollars (\$5,000) has been paid therefor ever since by the Freedmen's Bureau.

From the above statement the Howard University seems to have clear title to the land and buildings thereon, and it is not seen, therefore, why rent should not be paid to that institution if the hospital buildings continue in the occupancy of the United States. This opin-

ion is concurred in by Col. Winthrop of the Judge-Advocate's Department, with whom I conferred by direction of the Secretary of War.

Whether the rate of rent which has been paid is not exorbitant may be ascertained by appraising the property. But in fixing the rate to be paid by the United States in future, it is suggested whether the fact of the buildings having been constructed with Government funds, regularly appropriated, the fact of the lands having been purchased *virtually* with funds derived from the Government, and the fact that the "unfortunate class to be benefited" and cared for in the hospital in question, should not be taken into consideration.

Respectfully submitted.

ED. SCHRIVER,
Inspector-General.

The Honorable the SECRETARY OF WAR.

○

MATERIALS OF OLD PENITENTIARY IN WASHINGTON.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The taking down and removing the material of the old penitentiary situated on the Washington arsenal grounds.

JANUARY 31, 1873.—Referred to the Committee on Public Buildings and Grounds and ordered to be printed.

WAR DEPARTMENT,
January 30, 1873.

The Secretary of War has the honor to transmit to the House of Representatives, for the information of the Committee of Claims, as requested in letter of said committee of the 20th instant, copy of the contract entered into on the 13th September, 1867, between J. T. Stockbridge and Brevet Major-General George D. Ramsay, for taking down and removing the material of the old penitentiary, situated on the arsenal grounds, and copies of all correspondence relating to the same, on file in the office of the Chief of Ordnance.

The views of the commanding officer of the Washington arsenal, as expressed in this correspondence, are concurred in by this Department.

WM. W. BELKNAP,
Secretary of War.

UNITED STATES OF AMERICA.

WAR DEPARTMENT, *January —, 1873.*

Pursuant to the act of Congress of the 22d February, 1849, I hereby certify that the papers hereto attached are true copies of the originals on file in the Ordnance Bureau of this Department.

In witness whereof I have hereunto set my hand and caused the seal of the War Department to be affixed, on the day and year first above written.

[SEAL.]

WM. W. BELKNAP,
Secretary of War.

WASHINGTON ARSENAL,
September 21, 1867.

SIR: The "proposals for taking down the penitentiary buildings and walls" were opened to-day at 12 o'clock m., in accordance with my advertisement, dated September 9, 1867. They were in number forty-two, and ranged in prices as follows, viz:

Highest bid being \$41,214.72.

Lowest bid being \$7,500.

Very respectfully,

GEO. D. RAMSAY,
Brevet Major-General, Commanding

Gen. A. B. DYER,
Chief of Ordnance.

WASHINGTON ARSENAL,
October 22, 1867.

SIR: I have the honor to transmit herewith a copy of a contract made by me with J. T. Stockbridge, of Washington, D. C., "for taking down the penitentiary buildings on the arsenal grounds."

Very respectfully, your obedient servant,

GEO. D. RAMSAY,
Brevet Major-General, U. S. A., Commanding.

Gen. A. B. DYER,
Chief of Ordnance, Washington, D. C.

[Duplicate.]

[5-cent revenue stamp here.]

This contract, made and entered into this thirteenth day of September, one thousand eight hundred and sixty-seven, between J. T. Stockbridge, of Washington, in the District of Columbia, of the first part, and the United States, by Brevet Major-General George D. Ramsay, acting under direction and by authority of the Secretary of War, for and in their behalf, of the second part, witnesseth: That the party of the first part do hereby contract and engage with the said United States to take down all of the buildings, walls, &c., heretofore known as the penitentiary of the District of Columbia, with the exception of the houses on the east and west fronts. The party of the first part agree to commence said work on the 7th of October, and to carry it on so as to complete it in ninety days. It is agreed that for the faithful performance and strict compliance with this contract the United States, through the commanding officer of the Washington arsenal, shall pay the party of the first part the sum of seven thousand five hundred dollars (\$7,500) in lawful money of the United States; and the aforesaid party of the first part do further contract and agree to remove all of the materials, viz, slate, stone, brick, iron-work, wood-work, including roofing, doors, window-frames, water-gutters, and spouts, foundation stone, pavements, lightning-rods, &c., at present constituting the said penitentiary buildings, inclosing and connecting walls; to clean the bricks and bats in a manner suitable for building purposes; to pile the same and all other materials in a neat and compact manner, each separately and according to its kind, on such localities as shall be named contiguous to the premises aforesaid by the party of the second part. And that all of the aforesaid materials, as specified, are to be taken down and removed with proper care, and in all cases of any injury to the same from inattention or neglect, the amount shall be duly estimated and charged to the party of the first part. And, finally, it is hereby mutually stipulated and agreed that the specifications hereto annexed are, and the same are hereby, made part of this contract.

The above mentioned work is to be finished by the said party of the first part; and all claims under this contract, if transferred to another party, are to be by such transfer forfeited, saving the rights of the United States. Payments, in such funds as the Treasury Department may provide, are to be made on the faithful completion of the said work, within the prescribed time, as shall be satisfactory to the party of the second part.

And the said party of the first part do further engage and contract that no member of Congress, officer of the Army, or any agent of the military service, or other person forbidden by law so to do, *is, or shall be*, admitted to any share or part of this contract or agreement, or to any benefit to arise thereupon.

And it is hereby expressly provided, and this contract is upon the express condition, that if any such member of Congress, officer of the Army, or other person above named, *is, or shall be*, admitted to any share or part of this contract, or to any benefit to arise under it, or in case the party of the first part shall in any respect fail to perform this contract on his part, the same may be, at the option of the United States, declared null and void, without affecting their right to recover for defaults which may have occurred.

It is further stipulated and agreed that if any default shall be made by the party of the first part, in complying with the terms of this contract, of the quality and at the times and place therein provided, that then, in that case, the said party will forfeit and pay to the United States the sum of fourteen thousand dollars, as agreed, and liquidated damages.

J. T. STOCKBRIDGE, [SEAL.]

GEO. D. RAMSAY, [SEAL.]

Brevet Major-General, United States Army.

Signed, sealed, and delivered in presence of—

JNO. J. COOK.

Approved:

Brigadier-General, Chief of Ordnance.

[50-cent revenue stamp here.]

Know all men by these presents, that I, J. T. Stockbridge, of Washington, in the District of Columbia, as principal, and John F. Coyle, of Washington, in the District of Columbia, and C. H. Snow, of Washington, in the District of Columbia, as sureties, are held and firmly bound unto the United States of America in the penal sum of fourteen thousand dollars, to be paid to the said United States, or to their certain attorney, for which payment, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, firmly by these presents. Sealed with our seals, and dated the thirteenth day of September, A. D. 1867.

Whereas the above-bounden J. T. Stockbridge entered into the contract with the United States set forth in the foregoing covenant: now, therefore, the conditions of this obligation are such that if the said J. T. Stockbridge, heirs, executors, or administrators, shall well and faithfully fulfill each and every one of the aforesaid covenants, this obligation to be null and void; otherwise to be and remain in full force and virtue.

J. T. STOCKBRIDGE. [SEAL.]

JOHN F. COYLE. [SEAL.]

C. H. SNOW. [SEAL.]

SPECIFICATIONS FOR TAKING DOWN THE PENITENTIARY BUILDINGS AND WALLS.

First. All the buildings and the walls heretofore constituting the penitentiary of the District of Columbia are to be taken down, with the exception of the houses on the east and west points.

Second. All of material constituting said buildings and walls, viz, slate, stone, brick, iron-work, wood-work, including roofing, doors, window-frames, water-gutters and spouts, foundation-stone, pavements, lightning-rods, &c., are to be removed to a designated locality, and each separately, and according to its kind, piled in a compact manner.

Third. Before being piled, the bricks, including bats, are to be cleaned in a manner suitable for building purposes.

Fourth. The time in which to perform all of the aforesaid work will be distinctly stated in the proposals.

Fifth. The bids will specify the gross sum for the execution of the entire work. No partial bids will be entertained.

Sixth. It is to be distinctly understood that all the aforesaid materials are to be taken down and removed with proper care; and in all cases of any injury to the same from inattention or neglect, the amount shall be duly estimated and charged to the party of the first part.

Seventh. On the faithful completion of the work to the satisfaction of the party of the second part, the full amount agreed upon will be paid in such funds as the treasury may provide.

Eighth. Ample security for the faithful performance of the work will be required.

Ninth. The Government reserves the right of accepting or rejecting bids.

J. T. STOCKBRIDGE.

GEO. D. RAMSAY,

Brevet Major-General, U. S. A.

WASHINGTON ARSENAL,

September 30, 1867.

4 MATERIALS OF OLD PENITENTIARY IN WASHINGTON.

STATE of , County of , ss :

[5-cent stamp.]

, being duly sworn, deposes and says that he resides in the of in the State of ; that he is a ; and that the value of his property, over and above all debts and liabilities incurred by him, is over dollars, and that he is fully responsible for the amount of his obligation in the foregoing bond by him executed.

Sworn and subscribed this day of , before me.

WASHINGTON COUNTY,
District of Columbia, ss :

[5-cent stamp.]

John F. Coyle, being duly sworn, deposes and says that he resides in the city of Washington, in the District of Columbia ; that he is a ; and that the value of his property, over and above all debts and liabilities incurred by him, is over seven thousand dollars, and that he is fully responsible for the amount of his obligation in the foregoing bond by him executed.

Sworn and subscribed this thirteenth day of September, 1867, before me.

T. I. GARDNER, J. P.

WASHINGTON COUNTY,
District of Columbia, ss :

[5-cent stamp.]

C. H. Snow, being duly sworn, deposes and says that he resides in the city of Washington, in the District of Columbia ; that he is a ; and that the value of his property, over and above all debts and liabilities incurred by him, is over seven thousand dollars, and that he is fully responsible for the amount of his obligation in the foregoing bond by him executed.

Sworn and subscribed this thirteenth day of September, 1867, before me.

T. I. GARDNER, J. P.

[5-cent stamp.]

I certify that I have made due and diligent personal inquiry as to the ability of the sureties in this contract, and am satisfied that they are good and sufficient, and fully responsible for the sum of seven thousand dollars each.

T. I. GARDNER,
Justice of the Peace.

AN ACT TO DEFINE THE PAY AND EMOLUMENTS OF CERTAIN OFFICERS OF THE ARMY, AND FOR OTHER PURPOSES, APPROVED JULY 17, 1862.

SECTION 14. That no contract or order, or any interest therein, shall be transferred by the party or parties to whom such contract or order may be given to any other party or parties, and that any such transfer shall cause the annulment of the contract or order transferred, so far as the United States are concerned: *Provided*, That all rights of action are hereby reserved to the United States for any breach of such contract by the contracting party or parties.

SEC. 15. That every person who shall furnish supplies of any kind to the Army or Navy shall be required to mark and distinguish the same with the name or names of the contractors so furnishing said supplies, in such manner as the Secretary of War and the Secretary of the Navy may respectively direct ; and no supplies of any kind shall be received unless so marked and distinguished.

SEC. 16. That whenever any contractor for subsistence, clothing, arms, ammunition, munitions of war, and for every description of supplies for the Army or Navy of the United States, shall be found guilty by a court-martial of fraud or willful neglect of duty, he shall be punished by fine, imprisonment, or such other punishment as the court-martial shall adjudge ; and any person who shall contract to furnish supplies of any kind or description for the Army or Navy, he shall be deemed and taken as a part of the land or naval forces of the United States for which he shall contract to furnish said supplies, and be subject to the rules and regulations for the government of the land and naval forces of the United States.

CIRCULAR No. 2.—SERIES OF 1864.

*Concerning the enforcement of the terms of contracts.*ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, January 1, 1864.

The manner in which the obligations imposed by contracts executed in this office have frequently been interpreted, both by contractors and inspecting officers, as well as the variety of opinions as to the manner of executing their duties which seem to prevail among these officers, render it necessary for the Department to call the attention of all parties interested in contracts to the great importance of a clear understanding of the duties and obligations which appertain to and grow out of them.

Instances have lately been brought to the notice of the Department where contractors admitted that they have signed contracts without reading them over, and bound themselves to conditions of which they have subsequently professed entire ignorance. In such cases as this no excuses are valid.

The Department forces a contract on no person; the obligations such an instrument imposes are voluntarily assumed by the individual, and the presumption is that the signature of a party affixed to a contract is a guarantee that he is fully cognizant of all the obligations and penalties to which he has subscribed.

It must be distinctly understood that it is the intention of the Department, in all cases, to enforce, by every means in its power, the exact terms of all contracts to which it is a party; and all officers intrusted with carrying out the provisions expressed in such instruments are hereby directed to see that they are faithfully executed.

In order that there may be no misunderstanding as to the nature of the duties to be performed by each party to the contract, the following rules will hereafter be observed:

Duties of the inspecting-officer.

The inspecting-officer is charged with the duty of guarding the interests of the Government, and represents the Department in his transactions with the contractor.

He should make himself fully acquainted with the exact terms of every order and contract, the duty of supervising which has been assigned to him; and he is authorized to provide necessary means for carrying out the obligations by which the Government is bound.

He is to select as sub-inspectors men who, by their trade or business, are fully qualified for the duty, and who have no relationship of any kind, either to himself or the contractor.

He will see that the sub-inspectors are so compensated that their interest will be identical with that of the Government they serve.

He should be careful to provide such a number of sub-inspectors that there will be no delay in inspecting stores as fast as presented to him; and he is expected to base his estimate of the number required on the total amount of deliveries specified in the contracts, the inspecting duty connected with which is placed under his charge.

He will pass no stores that are not equal to the prescribed standard in every particular; and when disputes arise between sub-inspectors and contractors on this point, his decision will be final.

Appeals to this office should only be made in extraordinary cases.

Any contractor who tampers with, or either directly or indirectly offers a sub-inspector any compensation, will at once be reported to this office, and all deliveries under his contract suspended until further orders.

Any sub-inspector found violating his oath of office, or accepting any consideration of whatever nature from a contractor, will at once be dismissed, and his name and offense reported to this office and to all other inspecting-officers in the Department.

Duties of the contractor.

Upon receiving notice from this office that his proposal is accepted, he should diligently prepare to execute the contract, although the instrument itself may not reach him for several days.

He must have all the stores which are to be delivered on a specified day at the place of delivery long enough before that time to enable the inspecting officer to properly execute his work.

The inspection is a preliminary step to the reception of stores as much as the manufacture itself; and if stores have not been inspected they do not come within the terms of the contract, and cannot be accepted.

GEO. D. RAMSAY,
Brigadier-General, Chief of Ordnance.

OATH PRESCRIBED BY THE ACT OF CONGRESS APPROVED JULY 2, 1862.

DISTRICT OF COLUMBIA,
County of Washington, ss :

I, J. T. Stockbridge, of Washington, in the county of Washington, and District of Columbia, do solemnly swear that I have never voluntarily borne arms against the United States since I have been a citizen thereof; that I have voluntarily given no aid, countenance, counsel, or encouragement to persons engaged in armed hostility thereto; that I have neither sought, nor accepted, nor attempted to exercise the functions of any office whatever under any authority or pretended authority in hostility to the United States; that I have not yielded a voluntary support to any pretended government, authority, power or constitution within the United States, hostile or inimical thereto. And I do further swear that, to the best of my knowledge and ability, I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion: So help me God.

J. T. STOCKBRIDGE.

Sworn and subscribed to before me this 30th day of September, 1867.

T. I. GARDNER, J. P.

WASHINGTON ARSENAL,
November 14, 1867.

SIR: On the 30th of September, 1867, I entered into a contract with J. T. Stockbridge, of Washington, for the taking down of the penitentiary buildings, a copy of which was duly transmitted to you, and by the terms of which the work was to be commenced on the 7th of October, 1867, and to be completed in ninety days. More than one-third of this time has elapsed, and but very little progress has been made on the part of the contractor; and since the evening of Saturday last, the 9th instant, when he failed to pay the hands employed, the work has been abandoned, and I have not been able to see or to hold any intercourse with the contractor.

As Mr. Stockbridge has at no time come up to the spirit of the contract, or his personal assurances to me, I feel persuaded that he will not and cannot fulfill the contract. I am, therefore, induced to bring the matter under your consideration, and to ask what, under the circumstances, it is proper for me to do. I am much annoyed by the present state of affairs, and would most gladly undertake the work.

Very respectfully,

GEO. D. RAMSAY,
Brevet Major-General, Commanding.

Major-General A. B. DYER,
Chief of Ordnance.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, November 20, 1867.

SIR: Your letter of the 14th instant, reporting that Mr. Stockbridge, the contractor for pulling down the penitentiary, had abandoned the work, and would not, in your opinion, execute the contract, and asking what it was proper for you to do under the circumstances, is received. As Mr. Stockbridge is allowed ninety days from the 30th of September, 1867, to execute his contract, it cannot at present be assumed that he has abandoned the work, or will not execute the contract, unless he has given you notice to that effect; but you should inform his sureties of the condition of the work and of the suspension, so that they may have the opportunity to have the contract fulfilled by other parties in case of the inability of Mr. Stockbridge to execute it.

You should not undertake to execute the work until after the expiration of the time allowed Mr. Stockbridge to do it, unless requested to do so by his sureties.

Respectfully, &c.,

A. B. DYER,
Brevet Major-General, Chief of Ordnance.

Bvt. Maj. Gen. G. D. RAMSAY,
Commanding Washington Arsenal.

WASHINGTON ARSENAL,
January 7, 1868.

SIR: I have the honor to report that the contract entered into between J. T. Stockbridge, of Washington, D. C., and the United States, to take down all of the buildings, walls, &c., heretofore known as the penitentiary of the District of Columbia, has expired this day, by limitation of said contract, and that the said J. T. Stockbridge has failed to fulfill his obligations under the same.

The aforesaid J. T. Stockbridge, as principal, and John Coyle and C. H. Snow, both of Washington, D. C., as sureties, are held and firmly bound unto the United States of America in the penal sum of fourteen thousand dollars.

Very respectfully,

GEO. D. RAMSAY,
Brevet Major-General, Commanding.

Major-General A. B. DYER,
Chief of Ordnance.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, D. C., January 8, 1868,

GENTS: The failure of Mr. J. T. Stockbridge, of this city, to fulfill the obligations of the contract with the United States to take down the building at Washington arsenal known as the penitentiary, has been officially reported to this office. As you are the sureties of Mr. Stockbridge, and are held and bound for the faithful performance of the obligations of his contract in the penal sum of fourteen thousand dollars, you are hereby notified of the failure of your principal, as before stated, before taking measures for the enforcement of the penalty of your bond.

Respectfully, &c.,

A. B. DYER,
Brevet Major-General, Chief of Ordnance.

Messrs. JOHN COYLE and C. H. SNOW,
Washington, D. C.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, D. C., January 13, 1868.

SIR: Your letter reporting the execution of the contract to take down the penitentiary buildings at Washington arsenal, and the failure of the contractor to fulfill his obligations, has been received. You will now take such measures for having the work done as may be most advisable and advantageous to the public interest.

Respectfully, &c.,

A. B. DYER,
Brevet Major-General, Chief of Ordnance.

Bvt. Maj.-Gen. G. D. RAMSAY,
Commanding Washington Arsenal.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, D. C., January 13, 1868.

GENERAL: I inclose herewith a letter from Brevet Major-General Ramsay, reporting the failure of the contractor, Mr. J. T. Stockbridge, to take down the penitentiary building, at Washington arsenal, according to the requirements of his contract.

The original contract is now on file at the office of the Second Comptroller of the Treasury, with a bond attached, whereby the contractor, as principal, and Messrs. John Coyle and C. H. Snow, of this city, as sureties, are held and bound unto the United States in the penal sum of fourteen thousand dollars for the faithful performance of the obligations of the contract. They have been notified of the failure of their principal, and it is respectfully suggested that the Second Comptroller, or other proper officer of the Government, be requested to institute the proper measures for enforcing the bond.

General Ramsay has been directed to take such measures for having the work done as may be most advisable and advantageous for the public interest.

Respectfully, your obedient servant,

A. B. DYER,
Brevet Major-General Chief of Ordnance.

General U. S. GRANT,
Secretary of War ad interim.

[See the intervening correspondence hereto appended.]

Respectfully returned to the Chief of Ordnance to report if there has been any change in the condition of this case since the date of this recommendation.

By order of the Secretary of War.

L. H. PELOUZE,
Assistant Adjutant-General.

JUNE 17, 1868.

ORDNANCE OFFICE, June 25, 1868.

Respectfully returned to the Secretary of War. Since the date of the within letter, the work contracted to be done by Mr. Stockbridge has been completed by the United States at the cost \$10,021.77, which is \$2,521.77 more than it would have cost the United States if the contract had been faithfully executed by Mr. Stockbridge. This excess of cost should be paid to the United States by Mr. Stockbridge or his sureties.

A. B. DYER,
Brevet Major-General, Chief of Ordnance.

WAR DEPARTMENT, BUREAU OF MILITARY JUSTICE,
June 27, 1868.

Respectfully returned. The recommendation of the Chief of Ordnance, that suit be commenced on this bond, is concurred in.

J. HOLT,
Judge Advocate-General.

Approved by the Secretary of War, July 1, 1868.

ED. SCHRIVER,
Inspector-General.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, June 18, 1868.

SIR: I inclose herewith a letter from yourself to this Bureau, and one from this Bureau submitting it to the Secretary of War, in relation to the failure of Mr. J. T. Stockbridge to fulfill his contract for taking down the old penitentiary; and request that you will give me the information called for by the Secretary of War, by indorsement on the papers of 17th instant.

Respectfully, your obedient servant,

A. B. DYER,
Brevet Major-General, Chief of Ordnance.

Brevet Major-General G. D. RAMSAY,
Commanding Washington Arsenal.

WASHINGTON ARSENAL,
Washington, D. C., June 20, 1868.

SIR: In reply to your letter of the 18th instant, transmitting the indorsement of the honorable Secretary of War, I have the honor to report that in the case of Stockbridge and others, the only "change in the condition of this case," since the date of my letter to you of the 7th January, ultimo, has been the prosecution of the work by me, of taking down the penitentiary buildings, and which the contractor, Stockbridge, failed to accomplish, and much to the detriment of the United States. The circumstances connected with the contract of J. T. Stockbridge were particularly aggravating; he was unreliable in every respect, deceived his work people, and ultimately went off without paying them.

The papers sent to me are herewith returned.

Very respectfully,

GEO. D. RAMSAY,
Brevet Major-General.

Brigadier Major-General A. B. DYER,
Chief of Ordnance

WASHINGTON ARSENAL,
Washington, D. C., June 24, 1868.

SIR: The specifications for taking down the penitentiary buildings, &c., were:
1st. All the buildings and the walls heretofore constituting the penitentiary of the

District of Columbia, are to be taken down, with the exception of the houses on the east and west fronts.

2d. All the materials constituting said buildings and walls, viz, slate, stone, brick, iron-work, wood-work, including roofing, doors, window-frames, water-gutters, and spouts, foundation stone, pavements, lightning-rods, &c., are to be removed to a designated locality, and each separately and according to its kind piled in a compact manner.

3d. Before being piled the bricks and bats are to be cleaned in a manner suitable for building purposes.

For the faithful performance of the foregoing work, J. T. Stockbridge entered into a contract with the United States and in the sum of \$7,500, he being the lowest responsible bidder under proposals duly issued by me. The work to be commenced on the 7th October, 1867, and to be completed in ninety days. After the most aggravating delay and entire disregard to the spirit of the contract, Stockbridge formally relinquished the work on the 28th November, 1867, and, at the time, it was estimated by officials of the arsenal that the work done by him, viz, taking up, in part, pavements, tearing down walls and outbuildings, and removing some of the material, would not in value exceed \$500.

As the fulfillment of the contract embraced ninety days, I could not myself commence operations until the 23d January, 1868, mid-winter, and consequently had thereby to incur the greater expense from the shortness of the days and the unusual inclemency of the weather.

My estimate for carrying on the work was \$10,140.31. The actual cost under the specifications of the contract is just \$10,021.77, less than the estimate \$118.54.

The account will thus stand:

Expenditure on the part of the United States.....	\$10,021 77
Stockbridge contract	\$7,500
Stockbridge expenditure.....	500
	8,000 00
Actual loss to the United States.....	2,021 77

The foregoing statement is respectfully submitted in reply to your letter of the 22d instant.

Very respectfully,

GEO. D. RAMSAY,
Brevet Major-General.

General A. B. DYER,
Chief of Ordnance.

The work was commenced by me on the 23d January, 1868.

G. D. R.

WASHINGTON ARSENAL,
Washington, D. C., June 25, 1868.

SIR: My attention has just been called to the fact that in my letter to you of yesterday I omitted to state that no moneys were paid to Stockbridge on the part of the United States.

Very respectfully,

GEO. D. RAMSAY,
Brevet Major-General, Commanding.

Major-General A. B. DYER,
Chief of Ordnance.

H. Ex. 163—2

MONTANA INDIAN WAR CLAIMS.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The Montana Indian war claims of 1867.

JANUARY 31, 1873.—Referred to the Committee on Military Affairs and ordered to be Printed.

WAR DEPARTMENT, *January 28, 1873.*

The Secretary of War has the honor to submit to the House of Representatives certain additional papers pertaining to the investigation directed by Congress in section 10 of the act of July 15, 1870, into the Montana Indian war claims of 1867. These papers are submitted for file and consideration with other papers in the case heretofore transmitted to Congress, on the 4th of February, 1871, March 15th, 1872, and the 21st May, 1872.

WM. W. BELKNAP,
Secretary of War.

WASHINGTON, D. C., *January 28, 1873.*

SIR: I have the honor to submit to you, with reference to their transmission to the House of Representatives, certain claims pertaining to the Montana Indian war claims of 1867, which were reported last session of Congress by me as not having been presented for new consideration since the destruction of the papers in these claims in the Chicago fire of October 9, 1871, as follows:

1. John H. Ming, for stationery, September 30, 1867	\$100 50
2. John H. Ming, for stationery, May 12, 1867	119 38
3. John H. Ming, for stationery, September 23, 1867	662 55
4. John H. Ming, for stationery, September 12, 1867	63 00
5. John H. Ming, for stationery, October 5, 1867	78 00
6. John H. Ming, for quartermaster stores, August 5, 1867	200 00
7. John H. Ming, for quartermaster stores, September 1, 1867	200 00
8. Medrick Prévost, for clerical services in quartermaster's department ...	105 00
9. H. Siegel & Co., for clothing, furnished August 15, 1867	608 00
10. A. Hananer, for forage, furnished June 8, 1867	560 00
11. W. F. Sanders, for rent of buildings	1, 125 00
12. Frank Cleaveland, for commissary supplies, September 1, 1867	666 00
13. Frank Cleaveland, for commissary supplies, July 1, 1867	523 08

14. L. M. Black, for forage, September 1, 1867.....	\$3,480 00
15. L. M. Black, for forage, June 4, 1867.....	493 00
16. L. M. Black, for forage, June 1, 1867.....	374 97
17. L. M. Black, for forage, June 4, 1867.....	5,220 00
18. L. M. Black, for forage, August 31, 1867.....	6,499 50
19. L. M. Black, for forage, June 4, 1867.....	507 50
20. L. M. Black, assignee of W. W. Watkins, for forage, August 1, 1867.....	1,000 50
21. L. M. Black, assignee of W. W. Watkins, for forage, August 1, 1867.....	2,093 57½
22. Hugh Kirkendall, for service of teams.....	11,700 00
23. W. R. Gibson, for services as teamster.....	375 00
24. Charles R. Stuart, for horses and mules, July 11, 1867.....	1,600 00
25. W. S. Scribner, for supplies, June 19, 1867.....	6,567 10
26. J. W. Alley, agent, for quartermaster stores, June 18, 1867.....	408 00
27. J. M. Castner for rent of buildings, September 30, 1867.....	1,025 00
28. Daniel Henry, for subsistence stores, July 13, 1867.....	1,836 33
29. Edward O'Connell, for one horse.....	200 00
30. A. J. and R. W. Lindsay, assignees of Thomas J. Brawner, for services as teamster.....	47 50
31. Medrick Prévost, for clerical services in quartermaster's department...	150 00
32. W. Z. Thompson, for services as teamster.....	60 00
33. J. P. Bruce, for one horse, July 1, 1867.....	207 00
34. J. C. Irving, for clerical services, December 5, 1867.....	600 00
35. John Brunette, for commissary supplies, September 20, 1867.....	195 00
36. John Brunette, for supplies, May 30, 1867.....	111 25
37. E. W. Carpenter, for supplies, September 20, 1867.....	228 00
38. W. W. Watkins, for forage, September 1, 1867.....	2,000 13
39. J. M. Gallaher, for ferriage.....	412 00
40. Edward Owen, for ordnance and quartermaster stores.....	2,834 40
41. F. R. Merk.	
42. Couch and Drew.	

These cases have all been acted upon by me, and the report of the examination in each case will be found indorsed thereon.

Very respectfully, your obedient servant,

JAS. A. HARDIE,
Inspector-General.

The Hon. SECRETARY OF WAR.

No. 1.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to John H. Ming, Dr.

1867.

Sept. 30.	1 ream letter-paper, at \$25 per ream.....	\$25 00
	½ ream foolscap, at \$25 per ream.....	12 50
	½ ream legal cap, at \$25 per ream.....	12 50
	1 quart ink.....	7 50
	1 bottle carmine.....	2 50
	1½ dozen lead-pencils.....	4 00
	½ ream note-paper, at \$15 per ream.....	7 50
	1 box Government envelopes.....	3 00
	1 box small envelopes.....	6 00
	2 dozen blotting-pads, at \$2 per dozen.....	4 00
	4 gross steel pens, at \$3 per gross.....	12 00
	1 reference file.....	2 00
	6 bunches red tape.....	2 00
		100 50

I certify that the above account is correct and just; that the articles are to be, or have been, accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at — the — of —, 1867, of —, quartermaster, United States Army, — dollars and — cents, in full of the above account.

JNO. H. MING.

[Indorsement.]

I report, after investigation, that the stationery specified in the within voucher was furnished as claimed; and that an allowance should be made at the same rates as were allowed on the vouchers of E. W. Tilton, for stationery.

An award should be made to the lawful owner.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, January 11, 1873.

No. 2.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to John H. Ming, Dr.

1867,		
May 12.	18 quires blank-book, at \$1.60 per quire	\$28 80
	100 envelopes.....	7 00
	250 envelopes, at \$2 per hundred.....	5 00
✓	1 ream letter-paper	24 00
	$\frac{1}{2}$ ream foolscap paper.....	15 00
	2 $\frac{1}{2}$ dozen pen-holders, at \$1.60 per dozen.....	4 00
	3 gross steel pens, at \$4.50 per gross	13 50
	1 ebony ruler.....	3 50
	1 $\frac{1}{2}$ dozen lead-pencils, at \$4.50 per dozen.....	6 00
	1 $\frac{1}{2}$ dozen bottles black ink, at \$6.50 per dozen.....	7 58
	1 account-book	5 00
		119 38

I certify that the above account is correct and just; that the articles are to be, or have been, accounted for on my property return for the second quarter, ending on the 30th day of June, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at — the — of —, 1867, of —, quartermaster, United States Army, — dollars and — cents, in full of the above account.

JNO. H. MING.

[Indorsement.]

I report, after investigation, that the stationery specified in the within voucher was furnished as claimed; and that an allowance should be made at the same rates as were allowed on the vouchers of E. W. Tilton, for stationery.

An award should be made to the lawful owner.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, January 11, 1873.

No. 3.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to John H. Ming, Dr.

1867.		
Sept. 23.	2 reams note-paper, at \$15	\$30 00
	4 $\frac{1}{2}$ reams letter-paper, at \$20	90 00
	2 $\frac{1}{2}$ reams legal cap paper, at \$25.....	62 50
	4 reams foolscap paper, at \$23	92 00
	8 quires flat-cap paper, at \$1.50.....	12 00

1867.			
Sept. 23.	13	blank-books, at \$8.....	\$104 00
	30	memorandum-books, \$2.55.....	76 50
	3½	dozen blotting-pads, \$1.....	3 50
	8	dozen pencils, \$1.50.....	12 00
	17	inkstands, \$3.05.....	51 85
	6	gross steel pens, at \$3.50.....	21 00
	2½	dozen pen-holders, at \$1.20.....	3 00
	2	rulers, at \$2.50.....	5 00
	2	ink-erasers, at \$2.50.....	5 00
	3	ruling-pens, at \$2.25.....	6 75
	2	bottles carmine, at \$2.....	4 00
	5	bottles mucilage, at \$2.....	10 00
	1	paper-cutter, at \$1.25.....	1 25
	750	Government envelopes, at 70 cents for 25.....	21 00
	500	small envelopes, at \$1 for 25.....	20 00
	13	bottles ink, at \$2.40 each.....	31 20
			662 55

I certify that the above account is correct and just; that the articles are to be (or have been) accounted for on my property return for the third quarter, ending on the 30th day of September, 1869.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at _____, the _____ of _____, 1867, of _____, quartermaster, United States Army, _____ dollars and _____ cents, in full of the above account.

JNO. H. MING.

[Indorsement.]

I report, after investigation, that the stationery specified in the within voucher was furnished as claimed, and that an allowance should be made at the same rates as were allowed on the vouchers of E. W. Tilton, for stationery.

An award should be made to the lawful owner.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, January 11, 1873.

No. 4.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to John H. Ming, Dr.

1867.			
Sept. 12.	1	box eyelets.....	\$3 00
	3	gross steel pens, at \$4.50 each.....	13 50
	1	large ruler.....	5 00
	1	penknife.....	6 50
	3	Oliver patent inkstands, at \$7.50.....	22 50
	4	dozen pen-holders, at \$2 per dozen.....	8 00
	2	fine lead-pencils, at 50 cents each.....	1 00
	1	bottle red ink.....	3 50
			63 00

I certify that the above account is correct and just; that the articles are to be (or have been) accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at _____, the _____ of _____, 1867, of _____, quartermaster, United States Army, _____ dollars and _____ cents, in full of the above account.

JNO. H. MING.

[Indorsement.]

I report, after investigation, that the stationery specified in the within vouchers was furnished as claimed, and that an allowance should be made at the same rates as were allowed on the vouchers of E. W. Tilton, for stationery.

An award should be made to the lawful owner.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, January 11, 1873.

No. 5.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to John H. Ming, Dr.

1867.

October 5.	1 patent inkstand	\$10 00
	2 bottles red ink, at \$3.50 each	7 00
	3 gross steel pens, at \$4.50 each	13 50
	3 boxes paper-fasteners, at \$2.50 each	7 50
	4 dozen bunches red tape, at \$1.50 per dozen	6 00
	1 account-book	10 00
	2 bottles mucilage, at \$2.50 each	5 00
	2 bottles mucilage, at \$2.50 each	5 00
	4 lead-pencils, at 25 cents each	1 00
	1 large bottle ink	5 00
	1 bottle red ink	3 50
	1 gross steel pens	4 50
		78 00

I certify that the above account is correct and just; that the articles are to be (or have been) accounted for on my property return for the fourth quarter, ending on the 31st day of December, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at —, the — of —, 1867, of —, quartermaster, United States Army, — dollars and — cents, in full of the above account.

JNO. H. MING.

[Indorsement.]

I report, after investigation, that the stationery specified in the within voucher was furnished as claimed, and that an allowance should be made at the same rates as were allowed in the vouchers of E. W. Tilton, for stationery.

An award should be made to the lawful owner.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, January 11, 1873.

No. 6.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to John H. Ming, Dr.

1867.

August 5.	1 saddle-horse	\$147 00
	1 saddle	45 00
	1 bridle	8 00
		200 00

I certify that the above account is correct and just, and that the articles are to be or have been accounted for on my property return for the third quarter ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the ——— of ———, 187 —, of ——— ———, quartermaster, United States Army, the sum of ——— dollars and ——— cents, in full of the above account.

JNO. H. MING.

(Signed in duplicate.)

[Indorsement.]

The undersigned ascertained that the property had been furnished as stated, and recommends that an allowance be made at the same reduced prices as were allowed in the case of Higgins, Travis & Bro., in a previous report, being the same as is allowed in other claims of this nature.

The award should be made to the lawful owner of the voucher.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 7.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to John H. Ming, Dr.

1867.

September 1. 10 cords of pine wood, at the rate of \$20 per cord..... \$200 00

I certify that the above account is correct and just, and that the articles are to be or have been accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the ——— of ———, 187—, of ——— ———, quartermaster, United States Army, the sum of ——— dollars and ——— cents, in full of the above account.

JNO. H. MING

(Signed in duplicate.)

[Indorsement.]

The undersigned reports that, on investigation, he found the property described in this voucher was furnished as claimed.

An allowance should therefore be made upon the amount specified, but upon the same basis as to price, as other and similar claims which have already been reported on.

The award to be made to the lawful owner of the voucher.

JAS A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 8.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Medrick Prévost, Dr.

1867.

August 31. Services rendered as clerk in the Quartermaster's Department from August 11 to August 31, both days included, being twenty-one days, at the rate of \$150 per month..... \$105 00

I certify that the above account is correct and just; that the services were rendered as stated, and they were necessary for the public service; and the same have been accounted for on my report of persons and articles hired for the month of August.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GEEEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at —, the — of —, 1867, of —, quartermaster, United States Army, — dollars and — cents, in full of the above account.

MEDRICK PRÉVOST.

[Indorsement.]

The undersigned has ascertained that the services were rendered as claimed.
The claim should be allowed at the rate of \$125 per month, and the award made for Medrick Prévost.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 9.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to H. Siegel & Co., Dr.

1867.

Aug. 15.	20 pairs blankets, at \$10 each.....	\$200 00
	12 coats, at \$15 each.....	180 00
	12 pairs boots, at \$9 each.....	108 00
	24 shirts, at \$5 each.....	120 00
		<u>608 00</u>

I certify that the above account is correct and just, and that the articles are to be (or have been) accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at —, the — of —, 187—, of —, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

H. SIEGEL & CO.

(Signed in duplicate.)

[Indorsement.]

The undersigned was and is satisfied, from previous investigations, that the supplies were delivered as claimed by this voucher. An allowance should be made at the same prices as have been allowed upon claims for similar materials furnished, previously reported.

The award should be made to H. Seigel.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 10.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Abraham Hanauer, Dr.

1867.

June 8.	For 16,000 pounds of hay, at 3½ cents per pound.....	\$560
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I certify that the above account is correct and just, and that the articles are to be or have been accounted for on my property return for the second quarter, ending on the 30th day of June, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at —, the — of —, 187—, of —, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

ABRAHAM HANAUER.

(Signed in duplicate.)

[Indorsement.]

Upon investigation it appears that the property in question was never furnished, nor does it appear that any equivalent has been received.

The claim must be rejected.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 11.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to W. F. Sanders, Dr.

1867.

Dec. 15. For rent of building for commissary office, from May 1 to December 15, 1867, inclusive, (seven months and fifteen days,) at \$150 per month.. \$1, 125

I certify that the above account is correct and just; that the services were rendered as stated; and they were necessary for the public service; and the same have been accounted for on my report of persons and articles hired for the months of May, June, July, August, September, October, November, and December.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

Governor and Commander-in-Chief.

Received at —, the — of —, 1867, of —, quartermaster, United States Army, — dollars and — cents, in full of the above account.

WILBUR F. SANDERS.

[Indorsement.]

Occupation of building for public uses ascertained to have been had for the period stated. A fair allowance of rent is believed to be \$100 per month.

The allowance of \$750 on this voucher is recommended.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 12.

The United States to Frank Cleaveland, Dr.

1867.

Sept. 1. For 200 pounds of bacon, at 78 cents per pound \$156
For 600 pounds of sugar, at 85 cents per pound..... 510

666

I certify that the above account for \$666 is correct and just, and has not been paid by me for want of funds; that the articles were purchased at the lowest market price, and will be accounted for on my return of provisions for the month of September, 1867. The purchase was necessary for the following reasons: None on hand for issue.

J. J. HULL,
Colonel and Commissary-General, Montana Volunteers.

Received at Virginia City, Montana Territory, this — day of —, 186—, from —
—, — dollars and — cents, in full of the above account.

FRANK CLEVELAND.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

[Indorsement.]

It is respectfully reported in this case that no proof was brought forward, nor could I elicit any satisfactory evidence on the subject on the spot, of the delivery of the stores upon this voucher. The integrity of the voucher is not now questioned, but it must remain suspended until more satisfactory proof is produced.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 13.

The United States to Frank Cleaveland, Dr.

1867.

July 1. For 5,812 pounds potatoes, at 9 cents per pound..... \$523 08

I certify that the above account for \$523.08 is correct and just, and has not been paid by me for want of funds; that the articles were purchased at the lowest market price, and will be accounted for on my return of provisions for the month of July, 1867. The purchase was necessary for the following reasons: None on hand for issue.

J. J. HULL,
Colonel and Commissary-General, Montana Volunteers.

Received at Virginia City, Montana Territory, this — day of —, 186—, from —
—, — dollars and — cents, in full of the above account.

FRANK CLEVELAND.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

[Indorsement.]

It is respectfully reported in this case that no proof was brought forward, nor could I elicit any evidence upon the subject on the spot, of the delivery of the stores upon this voucher. The integrity of the voucher is not now questioned, but must remain suspended until more satisfactory proof is produced.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 14.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to L. M. Black, Dr.

1867.

Sept. 1. For 24,000 pounds of barley, at 14½ cents per pound, as per contract
dated June 1, 1867..... \$3,480

I certify that the above account is correct and just; and that the articles are to be, or have been, accounted for on my property return for the third quarter, ending 30th September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Received at ———, the — of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

L. M. BLACK.

(Signed in duplicate.)

No. 15.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to L. M. Black, Dr.

1867.

June 4. For 3,400 pounds of barley, at 14½ cents per pound, as per contract dated June 1, 1867 \$493

I certify that the above account is correct and just; and that the articles are to be, or have been, accounted for on my property return for the second quarter, ending on the 30th June, 1867.

—————,
Quartermaster.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

L. M. BLACK.

(Signed in duplicate.)

COUNCIL BLUFFS, IOWA, June 8, 1872.

SIR: I have in my hands a voucher of the Montana Indian war claim, 1867. It belongs to the First M. E. Church of this city. I see by section 10 of act of July 10, 1870, that the subject was referred to the Secretary of War for report. I have been informed by Washington telegrams that the President has approved a bill appropriating money to pay expense of Indian war of Montana, 1867. Be kind enough to inform me as to the precise action.

Yours, respectfully,

JOHN H. KEATLEY.

General W. W. BELKNAP,
Secretary of War.

COUNCIL BLUFFS, IOWA, June 21, 1872.

SIR: In response to yours of the 17th instant, I have the honor to inclose to you the voucher mentioned in the same, with affidavits of proof of ownership. After you have taken copy, as suggested, please return voucher to me by mail.

Respectfully, &c.,

JOHN H. KEATLEY.

General JAMES A. HARDIE,
Inspector-General Military Division of the Missouri.

No. 16.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Leander M. Black, Dr.

1867.

June 1. For 2,586 pounds of barley, at the contract price of 14½ cents per pound. \$374 97

I certify that the above account is correct and just; and that the articles are to be or have been accounted for on my property return for the second quarter, ending on the 30th day of June, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

LEANDER M. BLACK.

(Signed in duplicate.)

STATE OF IOWA, *Pottawattamie County*, ss:

I, John H. Keatley, being first duly sworn, on oath say that I am of lawful age; that I am a resident of Council Bluffs, Iowa; that there is now in my hands a voucher for \$374.97, on blank No. 12, dated June 1, 1867, in what is commonly known as the Montana war claims, issued by the territorial authorities to pay the expenses of suppressing Indian hostilities in Montana Territory during the year 1867; that said voucher is signed in duplicate by H. Cummings, colonel and quartermaster-general, and approved by Green Clay Smith, governor and commander-in-chief; that said voucher was drawn in favor of Leander M. Black; that said voucher is now the property of the First M. E. Church of Council Bluffs, Iowa.

JOHN H. KEATLEY.

Sworn to before me, and subscribed in my presence by the said John H. Keatley, this 21st day of June, 1872.

[SEAL.]

J. W. ROBINSON,
Clerk of District Court of Pottawattamie County, Iowa.

STATE OF IOWA, *County of Pottawattomie*, ss:

I, N. J. Bond, being first duly sworn, on oath say that I am of lawful age; that I was the true owner of voucher on blank No. 12, dated June 1, 1867, for \$374.97, given by the authorities of Montana Territory to Leander M. Black for quartermaster's stores used by said authorities in the suppression of Indian hostilities in said Territory in the year 1867, said voucher having been signed in duplicate and approved by Governor Green Clay Smith, governor of Montana Territory, for the quarter ending on the 30th day of June, A. D. 1867; that for value received the said voucher was transferred to me by the said Leander M. Black; that being the owner of the said voucher I transferred and delivered the same to the First M. E. Church of Council Bluffs, Iowa, to whom it now belongs, and who are the true owners of the same.

N. J. BOND.

Subscribed and sworn to before me by the said N. J. Bond, this 20th day of June, A. D. 1872.

[SEAL.]

J. LYMAN,
Notary Public.

[Indorsement.]

This case has already been reported on to Congress, and is transmitted for file in connection with other papers in the claim now in the hands of the Military Committee, House of Representatives.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., *January 11, 1873.*

No. 17.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to L. M. Black, Dr.

1867.

June 4. For 36,000 pounds of barley, at 14½ cents per pound, as per contract dated June 1, 1867..... \$5, 220

I certify that the above account is correct and just; and that the articles are to be or have been accounted for on my property return for the second quarter, ending on the 30th June, 1867.

H. CUMMINGS,
Colonel and Quartermaster.

Received at _____, the _____ of _____, 186 , of _____, quartermaster, United States Army, the sum of _____ dollars and _____ cents, in full of the above account.

L. M. BLACK.

(Signed in duplicate.)

No. 18.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to L. M. Black, Dr.

1869.

August 31. For 40,000 pounds of oats, at 14½ cents per pound	\$5,800 00
For 20,000 pounds of hay, at \$69.95 per ton	699 50
	6,499 50

Forage furnished in accordance with contract.

I certify that the above account is correct and just; and that the articles will be accounted for on my property return for the month ending 31st August, 1867.

H. CUMMINGS,
Colonel, Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at _____, the _____ of _____, 186 , of _____, quartermaster, United States Army, the sum of _____ dollars and _____ cents, in full of the above account.

L. M. BLACK.

(Signed in duplicate.)

224 WEST TWENTY-SECOND STREET,
New York, September 4, 1872.

SIR: I sent you, some ten days ago, a voucher with affidavit of ownership. I have had no acknowledgment of its receipt. Please let me know by return mail what disposition has been made with it, and oblige,

Yours, respectfully,

E. ROBINSON.

Mr. JAMES A. HARDIE.

224 WEST TWENTY-SECOND STREET,
New York City, August 22, 1872.

DEAR SIR: To-day I inclosed voucher, with affidavit, as you requested in your communication of 15th instant. Please acknowledge receipt, and send check to my address, as above. Voucher for \$507.50; forgot to inclose this with it.

Yours, respectfully,

E. ROBINSON.

JAMES A. HARDIE,
Inspector-General.

STATE OF NEW YORK, City and County of New York, ss:

Edwin Robinson, of said city, county, and State, being duly sworn, saith that he is the owner of the voucher hereunto attached, issued to L. M. Black, for 3,500 pounds of barley, at 14½ cents per pound, (as per contract dated June 1, 1867,) for \$507.50, delivered June 4, 1867. Voucher dated June 30, 1867, (H. Cummings, quartermaster,) headquarters Territorial Volunteers, Virginia City, Montana Territory.

E. ROBINSON.

Sworn to before me this 22d day of August, 1872.

[SEAL.]

GEORGE T. MORTIMER,
Notary Public, New York County.

No. 19.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to L. M. Black, Dr.

1867.

June 4. For 3,500 pounds of barley, at 14½ cents per pound, as per contract,
dated June 1, 1867..... \$507 50

I certify that the above account is correct and just; that the articles are to be, or have been, accounted for on my property return for the second quarter, ending on the 30th day of June, 1867.

H. CUMMINGS,
Colonel and Quartermaster.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at —, the — day of —, 186—, of —, quartermaster,
United States Army, the sum of — dollars and — cents, in full of the above
account.

L. M. BLACK.

(Signed in duplicate.)

[Indorsement.]

For file with other papers in the hands of the Military Committee of the House of
Representatives. Received since rendition of report.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, January 13, 1873.

No. 20.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to W. W. Watkins, Dr.

1867.

August 1. For 6,900 pounds of barley, at 14½ cents per pound..... \$1,000 50

I certify that the above account is correct and just; that the articles are to be, or have been, accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at —, the — day of —, 186—, of —, quartermaster,
United States Army, the sum of — dollars and — cents, in full of the above
account.

W. W. WATKINS.

(Signed in duplicate.)

No. 21.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to W. W. Watkins, Dr.

1867.

August 1. Eleven thousand three hundred and eighty-five pounds of bar-
ley, at 14½ cents per pound..... \$1,650 82½
Twelve thousand six hundred and fifty pounds of hay, at 3½ cents
per pound..... 442 75
2,093 57½

I certify that the above account is correct and just; that the articles are to be, or have been, accounted for on my property return for the fourth quarter, ending 31st December, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — day of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

W. W. WATKINS,

(Signed in duplicate.)

No. 22.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Hugh Kirkendall, Dr.

1867.

From July 28 to	For services of nine six-mule teams complete, with team-	
September 30.	sters included, from July 28 to September 30, 1867, inclu-	
	sive, sixty-five days, at the rate of \$20 per day for each	
	team	\$11,700 00

I certify that the above account is correct and just; that the services were rendered as stated, and accounted for on my report of persons and articles hired for the months of July, August, and September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — day of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

HUGH KIRKENDALL.

(Signed in duplicate.)

No. 23.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to W. R. Gibson, Dr.

1867.

October 15.	For services as teamster in the Quartermaster's Department at	
	Helena, Montana Territory, from May 15 to include October 15,	
	1867, five months, at \$75 per month	\$375 00

I certify that the above account is correct and just; that the services were rendered as stated, and that they were necessary for the public service.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — day of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

W. R. GIBSON.

(Signed in duplicate.)

No. 24.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Charles R. Stuart, Dr.

1867.

July 11. For seven serviceable horses for the use of First Regiment Montana Volunteers, at \$200 each.....	\$1,400 00
One serviceable mule, at \$200	200 00
	1,600 00

I certify that the above account is correct and just; that the services were rendered as stated, and that they were necessary for the public service, accounted for on third quarter, ending September 30, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the ——— day of ———, 186—, of ———, quartermaster, United States Army, the sum of ——— dollars and ——— cents, in full of the above account.

CHARLES R. STUART.

(Signed in duplicate.)

No. 25.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to W. S. Scribner, Dr.

1867.

June 19.	22 serviceable horses, at \$200 each	\$4,400 00
	3 serviceable work-mules, at \$200 each	600 00
	1 table and 1 desk with pigeon-holes	40 00
	31 pounds nails, at 50 cents per pound	15 50
	35 pounds horseshoe-nails, at 10 cents per pound	35 00
	1 pair blacksmiths' pincers	3 00
	79 sheath-knives, at \$2.50 each	197 50
	4 large steak-knives, at \$5 each	20 00
	64 pounds horseshoes, at 75 cents per pound	48 00
	85 table-spoons, at \$4 per dozen	28 33 $\frac{1}{3}$
	38 tin plates, at 25 cents each	9 50
	5 candlesticks, at 75 cents each	3 75
	6 riding-bridles, at \$6 each	36 00
	36 synches, at \$5 each	180 00
	465 $\frac{1}{2}$ pounds lariat-rope, at 80 cents per pound	372 40
	52 duck saddle-bags, at \$5 each	260 00
	5 bullet-ladles, at \$1.50 each	7 50
	12 cartridge-boxes, at \$5 each	60 00
	800 metal cartridges, at 18 cents each	144 00
	2,000 musket-caps, at \$3.33 per 100	66 66 $\frac{2}{3}$
	1 revolver	40 00
		6,567 15

I certify that the above account is correct and just; that the articles are to be or have been accounted for on my property returns for second quarter, ending 30th day of June, 1867, and that they were necessary for the public service.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at _____, the _____ day of _____, 186—, of _____, quartermaster, United States Army, the sum of _____ dollars and _____ cents, in full of the above account.

W. S. SCRIBNER.

(Signed in duplicate.)

No. 26.

HEADQUARTERS DISTRICT OF HELENA, MONTANA MILITIA.

The United States to J. W. Alley, agent, Dr.

1867.

June 18. Thirty-four pairs boots, at \$12 per pair \$408 00

I certify on honor that the above account is correct and just; that the said boots were actually received as stated; that no part of the same has been paid; and that there is due to J. W. Alley (agent) the sum of \$408, and that the same was absolutely necessary for the defense of the Territory.

JAS. L. FISK,

Colonel and Assistant Quartermaster, Montana Militia.

Received at _____, the _____ day of _____, 186—, of _____, the sum of _____ dollars and _____ cents, in full of the above account.

J. W. ALLEY, *Agent.*

(Signed in duplicate.)

No. 27.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to J. M. Castner, Dr.

1867.

Sept. 30. For rent of building used for recruiting-office from May 1 to September 30, inclusive, being five months, at the rate of \$125 per month	\$625 00
For rent of building used for hospital from June 1 to September 30, inclusive, being four months, at the rate of \$100 per month.	400 00
	<u>1, 025 00</u>

I certify that the above account is correct and just; that the services were rendered as stated; and that they were necessary for the public service, and the same have been accounted for on my report of persons and articles hired for the months of May to September, inclusive.

H. CUMMINGS,

Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,

Governor and Commander-in-Chief.

Received at _____, the _____ day of _____, 186—, of _____, quartermaster, United States Army, the sum of _____ dollars and _____ cents, in full of the above account.

J. M. CASTNER.

(Signed in duplicate.)

No. 28.

The United States to Daniel Henry, Dr.

1867.

Ju'y 13. For 70 pounds hominy, at 40 cents per pound	\$28 00
For 250 pounds salt, at 45 cents per pound	62 50
For 60 pounds soap, at 73 cents per pound	43 80
For 4,400 pounds flour, at 19 cents per pound	836 00
For 1,053½ pounds of pork, at 78 cents per pound	820 53
For 102 pounds beans, at 45 cents per pound	45 90
	<u>1, 836 33</u>

I certify that the above account for \$1,836.33 is correct and just, and has not been paid by me for want of funds; that the articles were purchased at the lowest market price, and will be accounted for on my return of provisions for the month of July, 1867. The purchase was necessary for the following reasons: None on hand for issue.

J. J. HULL,
Colonel and Commissary-General, Montana Militia.

Received, at Virginia City, —, in full of above account,

DANIEL HENRY.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

BOZEMAN, MONTANA TERRITORY,
October 17, 1872.

DEAR SIR: Inclosed find copies of vouchers belonging to Edward O'Connell, and affidavits accompanying the same, which, I judge by your report, can still be acted upon by you.

Should any desired information still be wanting, please let me know.

With much respect, your obedient servant,

T. B. GRAY.

General JAMES A. HARDIE,
Inspector-General, Chicago, Illinois.

No. 29.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Edward O'Connell, Dr.

For 1 serviceable horse, at \$200..... \$200

I certify that the above account is correct and just; the articles are to be (or have been) accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at —, the — of —, 1867, of —, quartermaster, United States Army, — dollars and — cents, in full of the above account.

A true copy:

T. B. GRAY,
Notary Public, Bozeman, Montana Territory.

(Original in duplicate.)

TERRITORY OF MONTANA, *County of Gallatin:*

On this 17th day of October, A. D. 1872, before me, the undersigned, notary public in and for the county and Territory aforesaid, came Edward O'Connell, to me well known to be the person he represents himself to be, who, being by me first duly sworn, deposes and says that he is the person to whom the accompanying voucher was issued; that it was issued to him for a good, serviceable California horse, duly furnished by him and sold to Captain and Acting Quartermaster Evans, of the Montana militia, and that he, the said O'Connell, is now the lawful holder and owner of said voucher, and has never received any other pay or consideration for the above-named horse.

ED. O'CONNELL.

Subscribed and sworn to before me the day and year last above written.

[SEAL.]

T. B. GRAY,
Notary Public.

TERRITORY OF MONTANA, *County of Gallatin*:

I, Arch. Graham, clerk and recorder of the county of Gallatin aforesaid, hereby certify that T. B. Gray is a duly authorized and acting notary public, as appears from records in my office.

Witness my hand and official seal this 17th day of October, A. D. 1872.

[SEAL.]

ARCH. GRAHAM,
Clerk and Recorder.

[Indorsement.]

I report on the within claim of Edward O'Connell for one horse that the property was furnished as claimed. An award of \$80 is made hereupon to the order of B. T. Gray, of Bozeman, Montana Territory, the owner of the voucher, that being the rate allowed for other horses purchased for the expedition.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, *January 15, 1873.*

No. 30.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Thomas J. Brawner, Dr.

From September 24 to October 12, 1867. For service as teamster for First Regiment Montana Volunteers, from September 24 to October 12, 1867, inclusive, being 19 days, at \$75 per month \$47 50

I certify that the above account is correct and just; that the services were rendered as stated, and that they were necessary for the public service, and the same have been accounted for on my report of persons and articles hired for the months of September and October.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

Governor and Commander-in-Chief.

Received at _____, the _____ of _____, 1867, of _____, quartermaster, United States Army, _____ dollars and _____ cents, in full of the above account.

THOS. J. BRAWNER.

Pay the within to _____.

THOMAS J. BRAWNER.

R. & J. & A. W. LINDSAY.

[Indorsement.]

This case has already been acted on, and this is for file with other papers in the claim in the hands of the Military Committee House of Representatives.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., *January 13, 1873.*

No. 31.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Medrick Prévost, Dr.

1867.

September 30. For service rendered as clerk in the quartermaster's department, from September 1 to September 30, inclusive, being one month, at the rate of \$150 per month \$150 00

I certify that the above account is correct and just; that the services were rendered as stated, and that they were necessary for the public service; and the same have been accounted for on my report of persons and articles hired for the month of September.

H. CUMMINGS,

Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,

Governor and Commander-in-Chief.

Received at ———, the ——— of ———, 1867, of ——— ———, quartermaster, United States Army, ——— dollars and ——— cents, in full of the above account.

MEDRICK PRÉVOST.

[Indorsement.]

The undersigned found, upon examination, that the services reported upon this voucher had been rendered as claimed. It is recommended that the same rate of pay be allowed for this clerk as has been allowed in other similar cases, viz, \$125 per month. The award to be made to the lawful owner. (In connection with this voucher, see supplementary sheet, Ex. Doc. 312, p. 42, Forty-second Congress, second session.)

JAS. A. HARDIE,

Inspector-General.

WASHINGTON, January 14, 1873.

No. 32.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to William Z. Thompson, Dr.

From September 1 to September 24. For services rendered as teamster, from September 1 to September 24, inclusive, 24 days, at the rate of \$75 per month. \$60 00

I certify that the above account is correct and just; that the services were rendered as stated, and that they were necessary for the public service, and the same has been accounted for on my report of persons and articles hired for the month of September.

H. CUMMINGS,

Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,

Governor and Commander-in-Chief.

Received at ———, the ——— day of ———, 186—, of ——— ———, quartermaster, United States Army, ——— dollars and ——— cents, in full of the above account.

W. Z. THOMPSON.

I certify that the above is a true copy of a voucher now in the possession of Edward O'Connell, duplicated.

T. B. GRAY,

Notary Public, Bozeman, Montana Territory.

TERRITORY OF MONTANA, *County of Gallatin, ss:*

Edward O'Connell, being first by me, the undersigned, notary public in and for the county and Territory aforesaid, duly sworn, deposes and says, that he was personally acquainted with the William Z. Thompson to whom the accompanying voucher was issued in the month of September, 1867, and that he does know that said William Z. Thompson did the service for which said voucher was issued, and that he, the said O'Connell, gave the said Thompson a horse fully worth \$65, at the time, in money, for this voucher, and \$5 in money; and that he, the said O'Connell, is now the lawful owner of said voucher, and that the said Thompson has removed from Montana Territory, and his whereabouts are now unknown to the deponent O'Connell.

ED. O'CONNELL.

Subscribed and sworn to before me this 17th day of October, A. D. 1872.

[SEAL.]

T. B. GRAY,

Notary Public

[Indorsement.]

I report upon this claim that the services were rendered as stated in the voucher, of which this is a copy, and I recommend that the same rate of pay be allowed as has been allowed to other teamsters in the same expedition. The award thus due to be made in favor of T. B. Gray, of Bozeman, Montana Territory.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, *January 14, 1873.*

No. 33.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to J. P. Bruce, Dr.

1867.

July 1. For one serviceable horse \$207 00

I certify that the above account is correct and just; that the articles are to be (or have been) accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — of ———, 1867, of ——— ———, quartermaster, United States Army, — dollars and — cents, in full of the above account.

JNO. P. BRUCE.

Pay to the order of ———.

JOHN P. BRUCE.

R. J. & A. W. LINDSAY.

[Indorsement.]

For file with other papers in the hands of the Military Committee House of Representatives. Received since rendition of report already acted upon on certified copies.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, *January 14, 1873.*

BALTIMORE, *August 30, 1872.*

DEAR SIR: Inclosed I send you original voucher and affidavit of my ownership. The same, I hope, will be satisfactory.

Respectfully, yours,

H. SIEGEL.

(Care M. Ring & Co., 322 W. Baltimore street, Baltimore, Md.)

General JAMES A. HARDIE, *Chicago.*

STATE OF MARYLAND, *Baltimore City, to wit:*

Be it remembered that on this 2d day of September, A. D. 1872, before me, the subscriber, a justice of the peace of the said State, in and for the city aforesaid, personally appeared Henry Siegel, and made oath on the Holy Evangely of Almighty God, that he is the owner of the annexed voucher.

Sworn to before—

[SEAL.]

OTTO BENNER, *J. P.*

STATE OF MARYLAND, *Baltimore City, set. :*

I hereby certify that Otto Benner, esquire, before whom the annexed affidavit was made, who has thereto subscribed his name, was, at the time of so doing, a justice of the peace of the State of Maryland, in and for the city of Baltimore, duly commissioned and sworn.

In testimony whereof I hereto set my hand and affix the seal of the superior court of Baltimore City this 2d day of September, A. D. 1872.

[SEAL.]

GEO. ROBINSON,
Clerk of the Superior Court of Baltimore City.

No. 34.

The United States to J. C. Irving, Dr.

1867.

Dec. 5. For services in the subsistence department as clerk to Colonel James L. Fisk, assistant commissary of subsistence, Montana volunteers, from August 7 to include December 5, 1867, four months, at \$150 per month \$600 00

I certify that the above account is correct and just; that the services were rendered as stated, and that they were necessary for the public service, and have not been paid by me for want of funds.

J. J. HULL,
Colonel and Commissary-General Montana Volunteers.

Approved :

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the ——— day of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of ——— dollars and ——— cents, in full of the above account.
JAMES C. IRVING.

(Signed in duplicate.)

[Indorsement.]

I report upon the within voucher that it was ascertained that the services claimed were ascertained to have been rendered.

An allowance of \$125 per month should be made, that being the rate allowed on other claims for similar services, and the award should be made to Henry Siegel.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 35

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Jno. Brunette, Dr.

1867.

Sept. 20. For two hundred and fifty pounds of bacon, at 78 cents per pound.. \$195 00

I certify on honor that the above account is correct and just; (the articles will be accounted for on my property-return for the month ending on the 30th day of September, 1867;) and that the same was absolutely necessary; that they were purchased at the lowest rates possible, and that I have not paid the account for want of funds.

J. J. HULL,
Commissary-General of Subsistence.

Approved :

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the ——— day of ———, 186—, of ——— ———, ——— dollars, in full of above account.

[Indorsement.]

I report upon this claim that the property was delivered, as stated in the voucher, and I recommend that an award be made at the reduced rates named in previous general and special reports upon this subject, now in the hands of Congress. The awards of the amounts thus found due should be made to the legal owner.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 36.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to John Brunette, Dr.

1867.

May 30	1 camp-kettle	\$8 00
	1 bake-oven	8 00
	1 coffee-pot	4 00
	1 mess-pan	6 00
	1 fry-pan	4 00
	3 tin-cups, at 75 cents each	2 25
	1 coffee-mill	4 00
	1 shelter-tent	75 00
		111 25

I certify that the above account is correct and just; the articles are to be, or have been, accounted for in my property return for the second quarter, ending on the 30th day of June, 1867.

H. CUMMINGS,
Colonel and Quartermaster.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the ——— of ———, 1867, of ——— ———, quartermaster, United States Army, ——— dollars and ——— cents, in full of the above account.

[Indorsement.]

I report upon this claim that the property was delivered, as stated in the voucher, and I recommend that an award be made at the reduced rates named in previous general and special reports upon this subject, now in the hands of Congress. The awards of the amounts thus found due should be made to the legal owner.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

ELLIOTT, BLAKESLEE & NOYES, FINE ART STORE,
(OLD STAND OF A. A. CHILDS & CO.,)
127 Tremont Street, Boston, May 21, 1872.

DEAR SIR: Your favor of 11th ultimo was laid aside, and has just turned up again. I have been away much of the time and so neglected it. I inclose you voucher for my claim. Mr. Carpenter was my agent in Montana, and, as you see, has receipted for the money at the bottom of the bill. I do not see how I can help the matter by my power of attorney, for the claim was in his name.

The goods were a patent combination mess-kit, and not the common Army mess-pan and kettle. They cost me, I believe, (I am not now sure, it was so long ago,) \$5 each to make, and he sold them to the Government at \$3 each, to close them out, and afford necessary supplies for the troops. I ought to have the money, and hope you will get it for me. If I can help you any by affidavit, or by power of attorney, please make out same, or send me word and I will attend to it at once.

Respectfully, yours, &c.,

E. BLAKESLEE.

Mr. FULLER.

WASHINGTON, D. C., May 23, 1872.

SIR: The within inclosed voucher, in duplicate, was received by me to-day, from Brevet Brigadier-General Erastus Blakeslee, late colonel of Connecticut cavalry, claiming to be the owner of it, and that Mr. Carpenter, who has receipted it, was his agent and that he was the owner of the mess-kits.

I file the claim with you, to be embraced in any supplemental report that may hereafter be made of outstanding vouchers, of which I am informed there is a large amount.

Very respectfully,

T. J. D. FULLER,
For Erastus Blakeslee.

The Hon. SECRETARY OF WAR.

[Indorsement.]

Respectfully referred to Inspector-General J. A. Hardie.
By order of the Secretary of War.

JOHN POTTS,
Chief Clerk, War Department.

MAY 27, 1872.

No. 37.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to E. W. Carpenter, Dr.

1867.

Sept. 20. For 76 mess-kits, at \$3 each..... \$228 00

I certify that the above account is correct and just, and that the articles have been accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster.

Approved :

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of ——— dollars and ——— cents, in full of the above account.

E. W. CARPENTER.

(Signed in duplicate.)

I report hereupon that the property was furnished, and that the value of the mess-kits was ascertained to be, at the time of their passing into the service of the United States, \$1.50 each. An award is therefore made E. Blakeslee, of Boston, for the amount of \$114.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

No. 38.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to W. W. Watkins, Dr.

1867.

Sept. 1. For 13,794 pounds of barley, at 14½ cents per pound..... \$2,000 13

I certify that the above account is correct and just; that the services were rendered as stated, and that they were necessary for the public service, and are to be, or have been, accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved :

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the ——— day of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of ——— dollars and ——— cents, in full of the above account.

W. W. WATKINS.

(Signed in duplicate.)

[Indorsement.]

The undersigned, after investigation, reports as follows:

W. W. Watkins informed the undersigned that he did not furnish any hay upon the group of vouchers assigned to him, other than upon three vouchers for about \$3,000, which were in his possession about a year ago.

No award can be made upon any vouchers of the group, save the three in question, which have not been re-presented since the fire at Chicago of October 9, 1871.

If this voucher be, however, one of the three held by Watkins, a fact which may possibly be proven, the claim may be disposed of by allowing an award to the legal owner of the voucher, for the amount of forage charged for, (for the undersigned satisfied himself that Watkins furnished the amount those three vouchers represent,) at the same price that was allowed on the vouchers of Black and others, reported on in previous reports.

JAS. A. HARDIE,
Inspector General.

WASHINGTON, D. C., *January 11, 1873.*

DEER LODGE, MONTANA TERRITORY, *July 13, 1872.*

SIR: Having only recently learned that the papers in the inclosed case were destroyed in the Chicago fire, I wrote my partner, Mr. Conrad, to procure another statement and affidavit from Mr. Gallaher, which I forward.

Respectfully, yours,

F. B. MILLER.

General J. A. HARDIE,
Chicago, Illinois.

DEER LODGE, MONTANA TERRITORY, *August 24, 1872.*

SIR: Your favor of 15th instant received and inclosed. Please find copy of J. M. Gallaher's original voucher. It was signed in duplicate. I only send single copy.

I am, with much respect, yours,

F. B. MILLER.

General JAS. A. HARDIE,
Chicago, Illinois.

No. 39.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to J. M. Gallaher, Dr.

1867.

Sept. 30. For the use of ferry at Gallatin City, Montana Territory, for crossing mounted officers and men of, and teams in service of, First Regiment Montana Volunteers from May 15 to September 30, 1867, inclusive.....	\$412 00
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I certify that the above account is correct and just; that the services were rendered as stated, and that they were necessary for the public service, and the same have been accounted for on my report of persons and articles hired for the months of May, June, July, August, and September.

H. CUMMINGS,
Colonel, Quartermaster-General.

Approved :

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

We certify that the above is a true copy of the voucher in my possession.

F. B. MILLER.
JOS. A. HYDE.

MONTANA TERRITORY, *Lewis and Clarke County*:

James M. Gallaher, being first duly sworn, deposes and says that the foregoing account of his against the militia of Montana Territory, organized under and by virtue of a proclamation of the governor of Montana Territory, dated — day of —, A. D. 1867, was contracted by said militia between the months of April and December, A. D. 1867; that he rendered a bill of the same to the then acting quartermaster of said militia, one Cummings, (whose first name is unknown to this affiant,) who issued to this affiant a voucher therefor; that the amount charged said militia was not unreasonable, being exactly the same that he charged other persons; that at the time said bill was contracted, United States currency in this Montana Territory was only worth and only passed for 80 cents on the dollar, gold being the basis upon which every person transacted their business and based their contracts; that he added the difference between currency and gold to said bill to conform to the basis of contracts to this Territory; that on or about the month of July, A. D. 1870, this affiant conveyed the voucher above mentioned, for a valuable consideration, to Messrs. Clarke, Conrad & Miller, of Helena, Lewis and Clarke County, Montana Territory; and further this affiant saith not.

JAMES M. GALLAHER.

Subscribed and sworn to before me this July 12, 1872.

[SEAL.]

HENRY ADDOMS,
*Notary Public.*MONTANA TERRITORY, *Lewis and Clarke County*:

Thomas Conrad, being first duly sworn, says that he is one of the members of the firm of Clarke, Conrad & Miller; that in or about the month of July, A. D. 1870, one James M. Gallaher, of Gallatin County, Montana Territory, conveyed to said firm a certain voucher, (the number of which is unknown to this affiant,) known as the "Montana militia voucher," for the sum of \$412; that said firm, some time during the year 1871, gave said voucher into the hands of one Inspector-General J. A. Hardie, of the United States Army, for examination and inspection; and, as this affiant is informed and believes, said Hardie carried said voucher with him to the city of Chicago, State of Illinois, his headquarters; and that the same was burned up in said city on or about October the 9th, A. D. 1872; and further this affiant saith not.

THOMAS CONRAD.

Subscribed and sworn to before me this July 12, 1872.

[SEAL.]

HENRY ADDOMS,
Notary Public.

[Indorsement.]

The undersigned has ascertained that the services have been rendered as claimed. The same rate of ferriage should be allowed as have been allowed in the awards of similar previous cases. The award should be made payable to F. B. Miller.

JAS. A. HARDIE,
*Inspector-General.*WASHINGTON, D. C., *January 11, 1873.*

HEADQUARTERS MILITARY DIVISION OF THE MISSOURI,
INSPECTOR-GENERAL'S OFFICE,
No. 560 Wabash Avenue, Chicago, Illinois, February 5, 1872.

SIR: At one time it appears that you were a claimant for any awards that might be found due on certain Montana Indian war vouchers, issued in the name of Edward Owens. If the original vouchers were in my possession at the time of the late fire in this city, they have been destroyed, but if you still hold them or have the means of restating your case, please do so by furnishing me with an affidavit setting forth your ownership of the vouchers and how you acquired possession of them, accompanied by copies of the vouchers.

If you have disposed of them, please state to whom, and, if possible, get the present owner to file his papers without delay, as required by inclosed circular from the War Department.

Very respectfully,

JAS. A. HARDIE,
*Inspector-General.*LEWIS NEWSOM, Esq.,
Gallipolis, Ohio.

WAR DEPARTMENT, *Washington City, October 30, 1871.*

All persons holding or claiming to own vouchers pertaining to the Montana Indian war claims of 1867, or claiming awards to be found due thereon, are requested to send forward copies of such vouchers, or statements of their claims in detail, with affidavits as to the fact of ownership, to Inspector-General James A. Hardie, United States Army, Chicago, Illinois.

Notwithstanding the destruction of the list of awards, nearly completed, and of important evidence pertaining to the claims, sufficient data exists upon which to frame a new list of awards without injurious delay.

By order of the Secretary of War.

JOHN POTTS,
Chief Clerk War Department.

No. 40.

Voucher No. 12.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Edward Owens, Dr.

1867.

June 11. 13 serviceable guns, at \$45 each	\$585 00
5 revolvers, at \$30 each	150 00
290 rounds of ammunition, at \$16 per hundred	46 40
150 pistol-cartridges, at \$10 per hundred	15 00
	796 40

I certify that the above account is correct and just, and that the articles are to be or have been accounted for on my property-return for the second quarter, ending on the 30th day of June, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of — dollars and — cents, in full of the above account.

EDWARD OWEN.

IRA W. BOOTON.
C. W. WHITE.
(Signed in duplicate.)

[Indorsement.]

The undersigned reports upon this voucher that the property within specified was received, and that an allowance should be made at the same prices as was allowed for similar articles in the case of Stephen Reynolds. An award should be made to Edward Owens or attorney.

JAMES A. HARDIE,
Inspector-General.

WASHINGTON, D. C., *January 11, 1873.*

Voucher No. 12.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Edward Owens, Dr.

1867.

September 3. For 2 head of serviceable horses, at \$207.50 per head	\$415 00

I certify that the above account is correct and just, and that the articles are to be or have been accounted for on my property return for the third quarter, ending on the 30th day of September, 1867.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of ——— dollars and ——— cents, in full of the above account.

EDWARD OWENS.

IRA W. BOOTON.
C. W. WHITE.
(Signed in duplicate.)

[Indorsement.]

The undersigned reports upon this voucher that the property was received as claimed, and that an allowance of \$80 apiece should be made for these horses. The award should be payable to Edward Owens or attorney.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

Voucher No. 22.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Edward Owens, Dr.

1867.

September 30. For services rendered as corral-master from June 1 to September 30, four months, at the rate of \$175 per month....	\$700
Less the amount of clothing charged to said E. Owens...	25
	<u>\$675 00</u>

I certify that the above account is correct and just, that the services were rendered as stated; and that they were necessary for the public service, and the same have been accounted for on my report of persons and articles hired for the months of June, July, August, and September.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the — day of ———, 186—, of ——— ———, quartermaster, United States Army, the sum of ——— dollars and ——— cents, in full of the above account.

EDWARD OWENS.

IRA W. BOOTON.
C. W. WHITE.
(Signed in triplicate.)

[Indorsement.]

The undersigned reports upon this voucher that the services were rendered as claimed, and that an allowance should be made at the same rate allowed upon similar claims heretofore reported on. The award should be made payable to Edward Owens or attorney.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., January 11, 1873.

Voucher No. 22.

HEADQUARTERS TERRITORIAL VOLUNTEERS, VIRGINIA CITY, MONTANA TERRITORY.

The United States to Edward Owen, Dr.

1867.

From July 1 to September 18. For hire of four mule-teams from July 1 to
 September 18, inclusive, seventy-nine days,
 at the rate of \$12 per day. \$948 00

I certify that the above account is correct and just, that the services were rendered
 as stated, and that they were necessary for the public service.

H. CUMMINGS,
Colonel and Quartermaster-General.

Approved:

GREEN CLAY SMITH,
Governor and Commander-in-Chief.

Received at ———, the ——— day of ———, 186—, of ——— ———, quartermaster,
 United States Army, the sum of ——— dollars and ——— cents, in full of the above
 account.

EDWARD OWENS.

IRA W. BOOTON.
 C. W. WHITE.
 (Signed in triplicate.)

[Indorsement.]

The undersigned reports upon this voucher that the services of this team were
 received as claimed, and that an allowance should be made at the same rate allowed
 upon similar claims heretofore reported on. The award should be made to Edward
 Owen, or attorney.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., *January 11, 1873.*STATE OF OHIO, *Gallia County, ss :*

I, Edward Owen, now a citizen of the county of Gallia, and State aforesaid, on my
 oath say, that in the spring of the year A. D. 1866, I went to the Territory of Montana
 and remained there until in the month of October, A. D. 1867, when I returned to said
 State of Ohio, where I remained until on or about the month of August, A. D. 1870,
 when I went to the State of Missouri, and remained there until the month of May, A.
 D. 1872, when I returned to Gallia County, Ohio, where I now reside, with my post-
 office address at Pine Grove, Gallia County, Ohio.

I further state that during my stay in the said Territory of Montana, Indian hostili-
 ties existed in said Territory to such an extent that the governor of said Territory called
 out the militia for the purpose of suppressing the same; during which time the said
 troops were engaged in said service, I furnished divers articles of quartermaster's
 stores, ordnance supplies, and done divers labors, during said hostilities, under the order
 of the governor of said Territory of Montana, and was to be paid for the same the full
 sum of \$2,834.40, and for which I received the four following vouchers, in dupli-
 cate form, as will more fully appear by reference to a list here given of them and their
 amounts; and the said vouchers herewith filed, issued and signed by H. Cummings,
 quartermaster-general, and approved by Governor Green Clay Smith, commander-in-
 chief, viz :

Voucher number 12, dated June 11, 1867	\$796 40
Voucher number 12, dated September 3, 1867	415 00
Voucher number 22, dated September 30, 1867	675 00
Voucher number 22, dated July 1, 1867	948 00

Amount due..... 2,834 40
 which said amount of \$2,834.40 is just and correct, and due to me on account of the
 said supplies furnished and labor done and performed by me, and which remains un-
 paid and to me belonging.

I further state that I have not received any other horse or horses, or guns, or revolv-
 ers, or ammunition, or any other Government property, for the whole of said claim,

or any part thereof, or any pay or compensation for said amount, or any part thereof, from any officer of said Territory, or of the United States Government, or any person therefor; nor have I sold, bartered, or given away the said claim, or any part of same, but to me the same wholly belongs.

I make this declaration in compliance with circular herewith filed and headed "War Department, Washington City, October 30, A. D. 1871," by order of the Secretary of War; (signed) John Potts, chief clerk War Department, that my said claim may receive favorable consideration and that I may be paid the said sum of \$2,834.40.

I further state that my said claim was by me once placed in the hands of one Lewis Newsom, esq., of Gallipolis, Ohio, for collection, and which remained in his hands until he departed this life, and to whom the accompanying letter was addressed February 5, 1872, written at Chicago.

That I hereby constitute and appoint Charles Mallohan, of Gallipolis, Ohio, my true and lawful attorney, to present and prosecute the above-described claim to completion; to receive any certificate, warrant, check, draft, or order that may issue in payment of said claim; to sign my name thereon, and to collect the same, all which acts, and doing in and about the said claim I will forever warrant, ratify, and approve. That my age is thirty-four years, and post-office address is Pine Grove, Gallia County, Ohio. That I have not been engaged in the rebellion of the United States in the war of 1861, against the Government thereof, nor in any other hostility or disloyalty to the Government of the United States, and still is a loyal citizen thereof.

I further direct all correspondence in and about said claim to be sent to my said attorney, Charles Mallohan, of said Gallipolis, Ohio.

EDWARD OWEN.

Attest:

IRA W. BOOTON.

C. W. WHITE.

On this 12th day of June, A. D. 1872, personally came before me, Henry A. Kent, a probate judge in and for Gallia County, Ohio, Ira W. Booton and C. W. White, persons known to me to be respectable and entitled to credit, who are citizens of the said county and State, with their post-office address at Gallipolis, Ohio; who, being by me duly sworn, upon their oath jointly say that they were present and saw Edward Owen sign his name to the foregoing statement, and that they are personally acquainted with him and know he is the person he represents himself to be in his foregoing declaration, which has been read and explained to them before signing the same; but of the correctness of the said claim as set up by the said Edward Owen, they cannot state.

They further say that they have no interest in this claim, direct or indirect, this 12th day of June, A. D. 1872.

IRA W. BOOTON.
C. W. WHITE.

The foregoing declaration was sworn to; the power of attorney therewith written was also acknowledged and subscribed by the claimant, Edward Owen; and the witnesses, Ira W. Booton and C. W. White, above named, also subscribed and were sworn to their joint affidavit, by me, after the said declaration and affidavit were fully read and explained to declarant and affiants; and I have no interest in this claim, direct or indirect.

Witness my hand and official seal this 12th day of June, A. D. 1872.

[SEAL.]

H. A. KENT, *Probate Judge.*

No. 41.

VIRGINIA CITY, MONTANA, *March 5, 1872.*

DEAR SIR: I this day received your letter of January 20, being about forty-three days on the road. The copies of vouchers which you request I have already forwarded to your address at Chicago, on January 25, and I trust that you have received same in due time. I also sent along with same the required proofs, &c.

In regard to vouchers burned, which I had deposited with William Blair & Co., and they certified that same were their property, as forfeited collateral security, I think that my affidavit, sent to you January 25, will cover sufficient proof that such is not the case, although I do not remember clearly that my testimony referred much to the particular point of ownership; at any rate, I can give all the proof necessary that same were and are mine, and I think when they receive my letter, which I wrote to to them this day, that they will not delay to correct same before you, and release their pretended claims on same, which was really surprising to me when I heard of same, to say the least of it, especially coming from a house like William Blair & Co. I

inclose you their letter, which will show you that they never made such claim to me
 I inclose herewith affidavit as to mule purchase, which is of my best recollection.
 Anything farther I can do in reference to my vouchers, including the Hanauer
 voucher, I shall promptly attend to at your command.

Yours, very respectfully,

F. R. MERK.

General JAMES A. HARDIE,
Inspector-General, United States Army.

WILLIAM BLAIR & CO., 30 AND 32 SOUTH CANAL STREET,
 BETWEEN RANDOLPH AND WASHINGTON,
Chicago, January 10, 1872.

DEAR SIR: In reply to yours of 23d ultimo, would say that we have this day sent our
 affidavit of the destruction of your vouchers to General James A. Hardie, Washington
 City.

The document, we trust, was drawn sufficiently full and explicit as to meet the re-
 quirements of the case. Hoping you may obtain the full amount of your claim, and
 buy a large cash bill of us in the spring,

We are yours, truly,

WM. BLAIR & CO.

Mr. F. R. MERK.

TERRITORY OF MONTANA, *Madison County, ss:*

Frederick R. Merk, of Virginia City, county and Territory aforesaid, being duly sworn,
 upon his oath says that, some time during the fall of 1867 deponent saw upon the street,
 in said Virginia City, a wagon with (as deponent remembers) four mules, for sale by
 auction; that deponent was informed that they were offered for sale by order of Colonel
 H. Cummings; that deponent bid upon the same at said sale, and bought the same in
 for about \$350; that thereafter, Colonel Cummings, or some person for him, demanded
 the amount so bid; that deponent refused to take the wagon and team unless the amount
 due deponent from said H. Cummings was allowed and credited on the amount; that
 after some conversation said indebtedness was allowed and credited by said Cum-
 mings or his agent, and deponent paid the balance. The mules were worn out and in
 very poor condition, and two of them died very shortly afterward.

F. R. MERK.

Subscribed and sworn to before me this 5th day of March, 1872.

F. C. DEIMLING,
Notary Public.

VIRGINIA CITY, MONTANA, *November 30, 1872.*

DEAR SIR: In your report to the Government relative to Montana war claims, I no-
 ticed that vouchers Nos. 182, 299, and 300 were allotted by you to lawful owner, and as
 I am the legal and just owner and holder of same, I am desirous to satisfy you or the
 Department to that effect, so as to remove all possible delay or suspense in settling my
 controversy, if there should be any, after Government should have ordered payment of
 vouchers. Voucher No. 182 was held by me as security, and afterward was purchased
 by me, and is now in my possession. Vouchers 299 and 300 were left by me with Wil-
 liam Blair & Co., of Chicago, as security, and said vouchers were destroyed in the
 great fire of that city, to which William Blair & Co. made affidavit to you. William
 Blair & Co. have also advised me in their letter of June 29, that they had written to
 you, informing you that they released all claims against said vouchers.

Now, will you please advise me if any counter claims are filed with you, and still ex-
 ist, and as to what I am further required to do to make payment come direct to me.

Yours, very respectfully,

F. R. MERK.

JAMES A. HARDIE,
Inspector-General, United States Army.

[Indorsement.]

For file with other papers in the hands of the Military Committee of the House of
 Representatives.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, *January 13, 1873.*

No. 42.

OFFICE OF S. P. AYRES,
ATTORNEY AT LAW AND NOTARY PUBLIC,
Osceola, Iowa, January 10, 1873.

DEAR SIR: One William Brunson desires me to ascertain whether "Couch & Drew" voucher No. 22, for transportation of freight in Montana Territory, for the Government, has been paid or not.

John Van Valkenburg, of Fort Madison, Iowa, was attending to it, but fails to respond to letters written to him asking information in reference to the business. The voucher was transferred to William Brunson, by assignment from Couch & Drew, the contractors.

Respectfully, yours,

S. P. AYRES.

General HARDIE,
Washington, D. C.

[Indorsement.]

Respectfully submitted for file with other papers in case of Couch & Drew, being a letter touching ownership of one voucher.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, *January 15, 1872.*

OFFICE OF T. W. TALLMADGE, MILITARY CLAIM AGENT,
Columbus, Ohio, January 15, 1873.

SIR: In compliance with your request by letter dated 11th instant, I herewith inclose for your inspection the original vouchers in favor of N. J. Bond, for transportation furnished the United States in Montana Territory, and which are the property of Jacob F. Kappes, assignee, amounting to the sum of \$5,149.

I also inclose a power of attorney duly executed by both N. J. Bond and J. F. Kappes, authorizing me to act as the attorney in the collection of the claims.

Very respectfully, your obedient servant,

T. W. TALLMADGE,
Attorney.

General JAS. A. HARDIE,
Inspector-General.

Know all men by these presents that I, N. J. Bond, of Pottawattamie County, Iowa, do hereby constitute and appoint T. W. Tallmadge, of Columbus, Ohio, my true and lawful attorney for me and in my name, to prosecute my claims against the United States, to amount of \$5,149, being vouchers in my favor for quartermaster's stores and transportation furnished the United States Government in Montana Territory, certified by H. Cummings, colonel and quartermaster-general, and George H. Smith, governor, which vouchers I assigned to Jacob F. Kappes for valuable consideration, and my said attorney is hereby authorized to adjust and collect said claim, and to receive and receipt for in my name any sum of money that may be found due me on account of said claim, and to receive in his own name payable to him on his order any check, draft, or warrant that may issue to me on my said claim.

In witness whereof I have hereunto set my hand and seal this 4th day of April, 1872.
[SEAL.] N. J. BOND.

In presence of—

The word "Polk" erased and "Pottawattamie" written over it.

D. C. BLOOMER.

STATE OF IOWA, *County of Pottawattamie, ss:*

Be it known that on this 4th day of April, 1872, personally appeared before the undersigned authority, in and for said county and State, N. J. Bond, who acknowledged the signing and sealing of the foregoing power of attorney to be his voluntary act and deed for the purpose therein stated.

Witness my hand and seal the day aforesaid.

[SEAL.]

D. C. BLOOMER,
Notary Public.

STATE OF IOWA, *County of Pottawattamie, ss :*

Know all men by these presents that I, Jacob F. Kappes, of said county, do hereby constitute and appoint T. W. Tallmadge, of Columbus, Ohio, my attorney to prosecute my claim against the United States for vouchers assigned to me for a valuable consideration by N. J. Bond, which are made in his favor for the sum of \$5,149, being for quartermaster's stores and transportation furnished the United States in Montana Territory, and certified by the quartermaster-general and the governor.

And my said attorney is hereby authorized to adjust said claims, to receive payment made thereon, and receipt in my name for any money that shall be paid thereon as though I was personally present.

JACOB F. KAPPES.

The letter "J" erased before execution.

In presence of—

D. C. BLOOMER.

STATE OF IOWA, *County of Pottawattamie, ss :*

Be it known that on this 4th day of April, 1872, personally appeared Jacob F. Kappes, and acknowledged the above power of attorney to be his voluntary act and deed for the purposes therein stated.

Witness my hand and seal the day aforesaid.

[SEAL.]

D. C. BLOOMER,
Notary Public.

[Indorsement.]

These papers should be filed with the other papers in this case now in the hands of the House Military Committee.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, D. C., *January 21, 1873.*

Original vouchers returned to T. W. Tallmadge, *January 28, 1873.*

BOZEMAN, MONTANA TERRITORY, *July 20, 1872.*

DEAR SIR: Please send me all my Montana vouchers, in order that I can get proof on those that are suspended, or partially so, and oblige,

Yours, truly,

L. M. BLACK.

General J. A. HARDIE.

Original sent as requested. Copies retained.

[Indorsement.]

These claims have already been acted on, and these papers are for file with other papers in the claims now in the hands of the Military Committee, House of Representatives.

JAS. A. HARDIE,
Inspector-General.

WASHINGTON, *January 13, 1873.*

SURVEY OF BEAR CREEK HARBOR, LAKE ONTARIO.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The survey of the harbor of Bear Creek, Lake Ontario.

JANUARY 31, 1873.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT, *January 30, 1873.*

The Secretary of War has the honor to transmit to the House of Representatives, in accordance with its resolution of the 23d instant, a copy of the report, dated October 28, 1872, of Major J. M. Wilson, of the Corps of Engineers, on the survey of the harbor of Bear Creek, Lake Ontario, with the letter of the Chief of Engineers, transmitting the same, with his remarks.

WM. W. BELKNAP,
Secretary of War.

OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., January 29, 1873.

SIR: In compliance with the following resolution of the House of Representatives of January 23, 1873, "That the Secretary of War be requested to transmit to this House a copy of the report of the engineers of the survey recently made of the harbor of Bear Creek, Lake Ontario," I beg leave to transmit herewith a copy of the report of Major J. M. Wilson, of the Corps of Engineers, on the survey referred to, dated October 28, 1872.

An artificial harbor of limited extent has been made at the mouth of Bear Creek by private enterprise, which is used almost exclusively by two iron companies for the shipment of iron and the receipt of coal and lime. For general purposes of commerce, and for shelter, the harbor would require to be enlarged to a width of at least 200 feet, with piers projecting into the lake to 12 feet water, and the space between the piers at the mouth of the creek excavated to the requisite depth. The cost of such a harbor, based upon the prices now being paid by the Govern-

ment for similar work on Lake Ontario, is estimated by the officer in charge of this examination, Major Wilson, at \$250,000.

Very respectfully, your obedient servant,

A. A. HUMPHREYS,

Brigadier-General and Chief of Engineers.

Hon. W. W. BELKNAP,

Secretary of War.

UNITED STATES ENGINEER OFFICE,

Oswego, New York, October 28, 1872.

GENERAL: I have the honor to forward the accompanying map and report of a survey of the harbor at Bear Creek, Lake Ontario, made under my direction, in accordance with the act of Congress, approved June 10, 1872.

Bear Creek is a small stream emptying into Lake Ontario, about twenty miles east of the mouth of the Genesee River. The harbor at present is very limited in extent, the width between the piers at the entrance being only about 60 feet, and is used almost exclusively by the Wayne County Mining Company and the Ontario Furnace Company, who ship large quantities of iron-ore and iron and receive large amounts of coal and limestone. The other business there at present seems to be insignificant in the extreme; in fact, the deputy collector of the port of Bear Creek, when requested by me to furnish a report of the revenue and commerce during the last fiscal year, stated in his reply that the report sent me was as near as he was able to make it, from the figures that he could obtain from the agents of the two companies doing business there. The natural advantages for a harbor are exceedingly limited; the location, however, is favorable for the development of the large iron-ore beds in the vicinity.

The plan of improvement of this harbor consists, as shown on the accompanying map, of prolonging the present west pier out to 12 feet water, building an east pier parallel to and 200 feet from it, removing the present east pier and excavating the rock from between the piers and in the creek to a depth of 12 feet at low water. The cost of the entire improvement will be \$250,000.

Bear Creek is in the collection district of Genesee. The nearest port of entry is Pultneyville, four miles east, where the United States is now engaged constructing a harbor. The nearest light-house is at Big Sodus, fifteen miles distant, and Fort Ontario, forty-three miles distant, is the nearest work of defense.

The revenue collected during the fiscal year ended June 30, 1872, was \$79.80. The number of vessels entering and clearing during the year was 159, with an aggregate tonnage of 39,750 tons. These vessels were as follows: 75 schooners, 81 canal-boats, 2 steam-barges, and 1 bark. Every two canal-boats were brought in by one tug.

The imports during the same period were as follows: 10,865 tons of coal; 2,820 tons of limestone; 2,529 tons of iron ore; 130 barrels of salt; 9,000 feet, board measure, of lumber. The value of the imports was \$95,798.

The exports for the fiscal year were as follows: 16,340 tons of iron ore; 6,000 tons of iron; 100 barrels of apples. The value of the exports was \$289,170.

The present piers were built by a company, and are constructed of timber, of a smaller size than I deem necessary to successfully withstand

the gales of Lake Ontario for any long period of time. To prevent any claim for damages for the removal of the east pier before the General Government undertakes any operations at this place, these piers should be turned over to the United States, or at least all claims for damages should be waived.

The prices for labor and materials given in the estimate in the accompanying report are about the same that the General Government is now paying for pier-work at the other harbors on Lake Ontario.

I am, general, very respectfully, your obedient servant,

JOHN M. WILSON,

Major of Engineers, United States Army.

Brigadier-General A. A. HUMPHREYS,

Chief of Engineers United States Army.

FORT NIAGARA,

Youngstown, New York, October 16, 1872.

MAJOR: I have the honor to submit the following report of my survey of Bear Creek Harbor, Lake Ontario, New York, together with a map of the harbor, and an estimate for its improvement, made in accordance with your instructions of July 23, 1872.

Bear Creek is a small stream, or run, about eight miles long, entering the lake at a point twenty miles east of Genesee River; it has no natural facilities or advantages as a harbor, being narrow at its mouth, shallow, and having a solid rock bed. The land along its margin, as well as along the lake shore, is from 10 to 15 feet above the lake, with occasional elevations of 20 to 30 feet. There are four grist-mills on its banks, usually in operation during the spring and fall, but at this time are doing nothing for want of water.

Extensive beds of red hematite-iron ore exist in Wayne County, within two or three miles of the lake, and some of them are worked in the neighborhood of Bear Creek by the Wayne County Mining Company, who have, for the improvement of their business, constructed a harbor of limited capacity at the mouth of the creek at an expenditure of \$47,000.

The Ontario Iron Furnace Company also uses the harbor for the reception of iron-ore, limestone, and coal, having, I am informed, a contract with the Harbor Company for the use of the eastern portion of it. The iron-ore is shipped to Buffalo, Albany, Syracuse, Cold Spring, on the Hudson, Geddes, Charlotte, New York; Erie, Pennsylvania; Cleveland, Ohio; and Hamilton, Ontario.

There are, at the harbor, one store, one grist-mill, and eleven houses, and at the furnace, two miles south, one store, two blacksmith-shops, and one hundred houses. The population near the harbor is small, it being only three years since it was opened for business. From fifty to sixty men are employed loading and unloading vessels. The blast-furnace makes 600 tons of pig-iron per month, and employs upward of fifty men. Six ore-beds are in full working order, and employ upwards of two hundred men, and about one hundred teams are employed hauling ore, limestone, and coal.

The Wayne County Mining Company state that they have shipped 22,800 tons of ore during the last fiscal year, and claim that if they had greater facilities for shipping they could now contract for 50,000 tons for the upper lake region, and 20,000 tons for the eastern market, but cannot fill the orders for want of harbor accommodations.

I surveyed the lake-shore line 2,200 feet east, and 2,600 feet west of the mouth of the creek, and established a line of buoys in 15 feet water. I then took soundings from stations on shore to the buoys, from the buoys to the mouth of the harbor, and along the line of buoys from east to west. I then surveyed the harbor and that portion of the creek which has been improved, a distance of 1,000 feet to the bridge, at which point there is no water, and the bed of the creek is solid rock. The survey was continued 500 feet farther along the bed of the creek, to a grist-mill, which is not now in operation for the want of water.

The soundings were taken to feet and quarter feet in the lake, the harbor, and the creek.

The water in the lake being very clear, I was able to see bottom, and found it all rock, large areas of it being smooth and unbroken, and when the strata were broken up, nothing but loose rock was visible. Considerable delay was occasioned, by the high winds, in taking the soundings, but in other respects the weather was favorable for our work. In the map of the harbor, herewith submitted, the soundings are reduced to the zero of the Oswego gauge.

The harbor had an average depth of water on the 20th of August of 6 feet 8 inches, or 5 feet 8 inches below zero. From two to two and a half feet of rock have been taken out by dredging, and it is supposed that but little more can be removed in that manner, either within the harbor, or over the area proposed to be inclosed by the new piers, (in case it should be determined to enlarge and improve the harbor.)

To reach the 12-foot curve there will be required an extension of the west pier of 570 feet, and an entire new pier of 870 feet on the east side, and to obtain a depth of water 12 feet below zero it will be necessary to remove, by blasting or other means, 32,133 cubic feet of solid rock.

Estimate of the cost of one crib, 30 feet by 20 feet by 10 feet, and superstructure 30 feet by 20 feet by 5 feet.

10 sticks hemlock, 12" x 12", 30' long, for bottom,	3,600 feet, board measure.	
10 sticks hemlock, 12" x 12", 20' long, for bottom,	2,400 feet, board measure.	
18 sticks hemlock, 12" x 12", 30' long, for crib...	6,480 feet, board measure.	
22 sticks hemlock, 12" x 12", 20' long, for crib...	5,280 feet, board measure.	
3-inch hemlock plank	1,100 feet, board measure.	
Total	18,860 feet, b. m., at \$22...	\$414 92

Superstructure.

15 sticks white pine, 12" x 12", 30' long.....	5,400 feet, board measure.	
15 sticks white pine, 12" x 12", 20' long.....	3,600 feet, board measure.	
60 linear feet white pine joists, 6" x 8".....	240 feet, board measure.	
3-inch white pine plank	1,400 feet, board measure.	
Total	10,640 feet, b. m., at \$30...	319 20

26 screw-bolts, 37" x 1½", with two washers, 400 pounds, at 9 cents.....	36 00
300 drift-bolts, 30" x 1½", 2,475 pounds, at 7 cents.....	173 25
7-inch wrought spikes, 80 pounds, at 8 cents.....	6 40
Stone in crib and superstructure, 40.375 cords, at \$7.....	282 62
Framing and building 29,500 feet timber and plank, at \$8.....	236 00
2,955 pounds iron bolts and spikes put into work, at 1 cent.....	29 55
Superintendence on each 30 linear feet.....	71 25
Total	1,569 19

Estimate of the cost of one crib and superstructure 30 feet by 20 feet by 7 feet.

21 sticks white pine, 30' x 1' x 1'	7,560 feet, board measure.	
22 sticks white pine, 20' x 1' x 1'	5,280 feet, board measure.	
3-inch white-pine plank	1,400 feet, board measure.	
6" x 8" white-pine joists	240 feet, board measure.	
Total	14,480 feet, b. m., at \$30...	\$434 40

3-inch hemlock plank, 1,100 feet, board measure, at \$18	19 80
26 screw-bolts, 37" x 1 1/4", 400 pounds, at 9 cents	36 00
124 drift-bolts, 30" x 1 1/8", 1,023 pounds, at 7 cents	71 61
7-inch wrought spikes, 80 pounds, at 8 cents	6 40
Stone in crib and superstructure, 11 cords, at \$7	77 00
Framing and building, 15,600 feet, board measure, at \$8	124 80
1,503 pounds of iron put into work, at 1 cent	15 03
Superintendence on each 30 linear feet	38 00
Total	823 04

Cost of improving the harbor.

41 cribs and superstructure, 30' x 20' x 15', at \$1,569.19	\$64,336 79
7 cribs and superstructure, 30' x 20' x 7', at \$823.04	5,761 28
32,133 cubic yards of solid rock excavation, at \$4.85	155,845 05
Removing 230 feet of east pier	1,495 00
	227,438 12
Ten per cent. for contingencies	22,743 81
Total	250,181 93

Respectfully submitted.

JAMES S. LAWRENCE,
Assistant Engineer.

Major JOHN M. WILSON,
Corps of Engineers, U. S. A.
H. EX. 165—2 .

THE UNIVERSITY OF CHICAGO

DEPARTMENT OF THE HISTORY OF ARTS

OFFICE OF THE DEAN

CHICAGO, ILLINOIS

1954

TO THE DEAN

FROM THE

DEPARTMENT OF THE HISTORY OF ARTS

CHICAGO, ILLINOIS

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1954

TO THE DEAN

FROM THE

GEOLOGICAL SURVEY OF THE TERRITORIES.

LETTER

FROM THE

ACTING SECRETARY OF THE INTERIOR,

RELATIVE TO

An appropriation required for the continuation of the geological survey of the Territories of the United States, under the directions of his Department.

JANUARY 31, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., January 27, 1873.

SIR: I have the honor to transmit herewith a copy of a letter of this date from Professor F. V. Hayden, United States geologist, submitting an estimate of appropriations, copy also herewith, required for the continuation of the geological survey of the Territories of the United States under the direction of this Department.

The results of Professor Hayden's labors in his several surveys, made under the direction of this Department, are most important and useful to the country at large, and in view of the immense field yet unexplored, a continuance of his operations, looking toward the development of our vast territorial domain, is deemed a subject worthy of favorable consideration by Congress.

Concurring in the views contained in Professor Hayden's letter, I earnestly recommend the appropriation of the sum asked for by him.

I am, sir, very respectfully, your obedient servant,

B. R. COWEN,
Acting Secretary.

Hon. JAMES G. BLAINE,
Speaker of the House of Representatives.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., January 27, 1873.

SIR: I would most respectfully ask the attention of the Secretary of the Interior to the following views, in behalf of an appropriation for the expense of continuing the geological survey of the Territories of the United States during the fiscal year ending June 30, 1874.

The success which has attended its efforts during the past six years, the publication and distribution of its annual reports, which have been received with great favor, not only by the people in our own country, but in all parts of the world, would appear to entitle it to the confidence of Congress. I therefore venture to ask that additional power be given it to increase its efficiency, that it may continue to command the respect not only of men of science, but of the intelligent world generally.

For the last two years the survey has operated about the sources of the Missouri and Yellowstone Rivers, but the expenses of transportation, subsistence, and labor are so great, that it seems desirable to delay the further prosecution of the work in the Northwest until railroad communication shall be established. The Indians, also, are in a state of hostility over the greater portion of the country which remains to be explored. It seems desirable, therefore, to transfer the field of labor, for the coming season, to the eastern portion of the Rocky Mountain range, in Colorado and New Mexico. I propose to commence with the southern limit of the belt of the survey of the fortieth parallel, so successfully completed under the direction of Mr. Clarence King. The north limit of the area marked out is latitude $40^{\circ} 30'$; the western limit, the east bank of the Green and Colorado Rivers; the eastern limit, the 103d meridian west of Greenwich, extending to belt southward to the south line of the United States.

There is probably no portion of our continent, at the present time, which promises to yield more useful results, both of a practical and scientific character. This region seems to be unoccupied, at this time, as far as I am aware, by any other survey under the Government, and the prospect of its rapid development within the next five years, by some of the most important railroads in the West, renders it very desirable that its resources be made known to the world at as early a date as possible.

To render the organization more perfect, and to guarantee that it can meet the demands of the Government, so far as its duties are concerned, Mr. J. T. Gardiner, so long favorably known as the chief topographer of the geological survey of the fortieth parallel, under the direction of Mr. Clarence King, has become associated with me as chief of the topographical staff. Mr. Gardiner brings with him to this work the ripe experience of ten years of topographical work, extending over an area from the Pacific coast to the east base of the Rocky Mountains.

Mr. Gardiner thus expresses his conception of a true topographical map for geological purposes:

“For making maps suited to geological purposes it is necessary to carry over the country a systematic trigonometric and topographical survey, checked by astronomical observations. The maps must represent the features of the country accurately, and in bold relief; or, in other words, they must be a picture of the earth's surface as one would see it looking down from above.”

The work of the survey as contemplated by the present organization demands the very highest order of talent. To command this, it is necessary that the young men who may embark in this enterprise should feel a confidence in the permanency of the work, instead of regarding it as a stepping-stone to more lucrative positions. Each professional assistant is worth to the Government from fifty to one hundred per cent. more, every succeeding year. To make thorough astronomical, topographical, meteorological, geological, and botanical researches, and to develop the mining and agricultural resources properly, trained ex-

perts in all the different departments are absolutely essential. Such men, to identify themselves permanently with the survey, must be paid in proportion to their abilities.

I venture to assure you that the most rigid economy will be exercised in the expenditure of the public money under all circumstances.

In support of these views I would most earnestly beg your sanction to the estimate of \$100,000 for the continuation of the survey.

I have the honor to be, your obedient servant,

F. V. HAYDEN,

United States Geologist.

Hon. C. DELANO,

Secretary of the Interior.

For the continuation of the geological survey of the Territories of the United States, by Professor F. V. Hayden, under the direction of the Secretary of the Interior, during the fiscal year ending June 30, 1874, \$100,000, to be available on the passage of this law.

○

FREIGHTS VIA ISTHMUS OF PANAMA.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The amounts paid on materials, stores, &c., shipped via the Isthmus of Panama and Cape Horn for the fiscal years ended June 30, 1870, and 1871.

JANUARY 31, 1873.—Referred to the Committee on Military Affairs.

WAR DEPARTMENT, *January 29, 1873.*

The Secretary of War has the honor to return to the House of Representatives the resolution of the 7th instant calling for a report of the amounts paid for freight upon materials, stores, and supplies for the use of the United States forces at military stations on the west coast of the United States, via the Isthmus of Panama or Cape Horn, for the fiscal years ended June 30, 1870, and 1871, and to invite attention to the accompanying report of the Quartermaster-General containing the information requested.

WM. W. BELKNAP,
Secretary of War.

QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., January 25, 1873.

SIR: I have the honor to report, in reply to resolution of the House of Representatives of January 7, 1873, requesting statement of amounts paid for freight on materials, stores, and supplies, for use of United States forces at military stations on the west coast of the United States and Pacific Ocean, via the Isthmus of Panama or Cape Horn, for the fiscal years ended June 30, 1870, and 1871, that the records of this office show that the following amounts were paid for such transportation during the period required, viz:

Via Isthmus of Panama	\$32,194 89
Via Cape Horn	59,284 81
Total	<u>91,479 70</u>

The resolution of Congress is returned herewith.

Very respectfully, your obedient servant,

M. C. MEIGS,

Quartermaster-General, Brevet Major-General, U. S. A.

The Honorable SECRETARY OF WAR,
Washington, D. C.

CONSULAR AGENTS.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

RELATIVE TO

Consular agents, their reports and expenses.

JANUARY 31, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

To the Senate and House of Representatives :

In compliance with section 2 of the act approved July 11, 1870, entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June 30, 1871, and for other purposes," I have the honor to submit herewith a letter of the Secretary of the Treasury, relative to the consular agents appointed under authority of said act, together with the amounts paid such agent; and to transmit the report of the said agent upon the consular service of the United States.

U. S. GRANT.

EXECUTIVE MANSION,
January 31, 1873.

TREASURY DEPARTMENT,
January 30, 1873.

SIR : In compliance with section 2, of the act approved July 11, 1870, entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June 30, 1871, and for other purposes," I have the honor to inform you that no new appointments of agents have been made under said section of law, as stated in my letter of December 11, 1872. However, the commission of De B. Randolph Keim, esq., was extended until December 1, 1872. I inclose for transmission to Congress the last report received from Mr. Keim, which contains a digest of all of his previous reports, and a summing up of the results of his investigations into the consular affairs of the United States.

It is also explanatory of an appended "bill to establish a consular service for the United States of America, and to amend and consolidate sundry acts of Congress relating to the duties of consular officers."

No payments have been made to Mr. Keim since my letter of December 11, 1872.

Very respectfully, your obedient servant,

GEO. S. BOUTWELL,

Secretary.

The PRESIDENT.

THE CONSULAR SERVICE
OF
THE UNITED STATES OF AMERICA:

ITS

PRESENT CONDITION, AND A PLAN OF RE-ORGANIZATION, EMBODIED
IN "A BILL TO ESTABLISH A CONSULAR SERVICE FOR THE
UNITED STATES OF AMERICA, AND TO AMEND AND
TO CONSOLIDATE SUNDRY ACTS OF CONGRESS
RELATING TO THE POWERS AND
DUTIES OF CONSULAR
OFFICERS;"

BEING

AN EPITOME OF OFFICIAL INVESTIGATIONS EMBRACED IN COMMUNICATIONS AND REPORTS

ADDRESSED TO THE

HON. GEO. S. BOUTWELL,
SECRETARY OF THE TREASURY,

DURING THE YEARS 1870, 1871, AND 1872.

BY

DE B. RANDOLPH KEIM,

AGENT FOR THE EXAMINATION OF THE ACCOUNTS AND BUSINESS OF THE
CONSULATES OF THE UNITED STATES OF AMERICA ON THE BRITISH
ISLES, IN THE COUNTRIES OF CONTINENTAL EUROPE,
CHINA AND VICINITY, THE EAST INDIES, AND
ON THE COASTS OF AFRICA AND
SOUTH AMERICA.

THE UNITED STATES OF AMERICA

TO CONSOLIDATE AND ENFORCE THE LAWS OF THE UNITED STATES OF AMERICA, AND TO PROVIDE FOR THE BETTER REGULATION OF THE CUSTOMS AND REVENUE OF THE UNITED STATES OF AMERICA.

A BILL FOR THE PURPOSES ABOVE DESCRIBED.

BY SENATOR JOHN C. CALHOUN.

INTRODUCED IN THE SENATE, JANUARY 1846.

BY SENATOR JOHN C. CALHOUN.

REPORT FOR THE YEAR 1846, AND FOR THE YEAR 1847, OF THE COMMISSIONERS OF THE LAND OFFICE, IN RESPONSE TO A RESOLUTION OF THE SENATE, PASSED MAY 18, 1846.

THE CONSULAR SERVICE OF THE UNITED STATES OF AMERICA, WITH AN APPENDED BILL.

READING, PENNSYLVANIA, *December 31, 1872.*

SIR: This report will terminate my investigations into the condition of the accounts and business of the consulates of the United States of America, under the provisions of the second section of the "act making appropriations for the consular and diplomatic expenses of the Government for the year ending June 30, 1871, and for other purposes," approved July 11, 1870.

In this important work, from the date of my appointment up to the present time, I have been engaged for nearly two years and six months. I have constantly had in mind a desire to accomplish some permanent results; with what success the future must determine.

This report, in a brief form, contains the substance of all my communications on the subject of the consular service, and the bill accompanying it embodies all the recommendations which I have made or still have to make in the matters of re-organization and improvement.

AUTHORITY TO EXAMINE.

I received my original appointment, as agent of the United States for the examination of consular affairs, &c., under the act of Congress, on July 19, 1870. I lost no time in starting on my journey, but experienced a delay of several weeks in waiting for a steamer to bear me from San Francisco, California, to Yokohama, Japan.

My route in this first official tour of consular examination was as follows:

	Miles.
From Washington, D. C., United States of America, by trans-continental railway, to San Francisco, California, United States.....	3, 272
From San Francisco, California, United States, to Yokohama, Japan, (summer route).....	4, 764
From Yokohama to Yedo, Japan, and return.....	40
From Yokohama, via the inland sea of Japan, to Shanghai, China, visiting the consulates of the United States at Hiogo, Osaka, and Nagasaki, ports of Japan.....	1, 190
From Shanghai, China, to Tien-tsin, North China, visiting the port of Chee-foo.....	763
From Tien-tsin to Pekin, China, and return.....	160
From Tien-tsin to Shanghai.....	763
From Shanghai to Han-kow, China, visiting the consulate of the United States at Chin Kiang.....	604
From Han-kow to Shanghai.....	604
From Shanghai to Hong-Kong, China, (British dominions,) via the Chinese ports of Foo-chow-foo, Amoy, and Swatow.....	920
From Hong-Kong, China, to Canton, and return.....	192
From Hong-Kong, China, to Macao, China, (Portuguese dominions,) and return.....	80

	Miles.
From Hong-Kong to Singapore, Malay, peninsula via Saigon..	1, 437
From Singapore to Batavia, Java, (dominions of the Netherlands,) and return.....	900
From Singapore to Calcutta, British India.....	1, 667
From Calcutta to Bombay, British India, via Great Indian Railway.....	1, 600
From Bombay to Suez, Egypt.....	2, 972
From Suez to Alexandria, Egypt, via overland railway.....	224
From Alexandria to London, England, via the Brindisi route..	1, 400
From London, England, to Panama, United States of Colombia, via Aspinwall.....	5, 045
From Panama down the west coast of South America, through the Straits of Magellan, and up the east coast to Rio de Janeiro, Brazil, visiting Guayaquil, Ecuador; Tumbez, Payta, Callao, Lima, Isla, and Arica, Peru; Coquimbo, Guayacan, Valparaiso, and Coronel, Chili; Punta Arenas, Patagonia, (Straits of Magellan,) and Montevideo, Uruguay, about....	13, 500
From Rio de Janeiro, Brazil, to New York, United States, visiting Bahia, Pernambuco, and Para, Northern Brazil.....	5, 200
From New York to Washington.....	228
Total number of miles traveled.....	47, 685

After revising my communications from the consulates visited during the above tour, (Ex. Doc. No. 11, House of Representatives, second session Forty-second Congress,) I completed a general report, dated at Washington, D. C., May 22, 1872, which was submitted by the President to Congress, May 24, 1872. (Ex. Doc. No. 317, House of Representatives, Forty-second Congress, second session.)

SECOND TOUR OF CONSULAR EXAMINATION.

By your letter of instructions of date of June 7, 1872, I was directed to examine the accounts of the principal consular officers of the United States in Europe, including England, Scotland, and Ireland. I set out on this second tour of examination on the first steamer from New York upon which I could secure suitable accommodations. This was June 29, 1872.

The following is a *résumé* of my route of travel on this official journey:

	Miles.
From Washington, D. C., to New York.....	228
From New York, United States, to Queenstown, Ireland.....	2, 777
From Queenstown to Cork, Ireland.....	11
From Cork to Dublin, Ireland.....	165
From Dublin to Belfast, Ireland.....	112
From Belfast, Ireland, to Glasgow, Scotland.....	100
From Glasgow to Dunblane, thence to Perth and Dundee, and thence to Edinburgh.....	171
From Edinburgh, Scotland, to Liverpool, England.....	225
From Liverpool to Manchester, England, and return.....	64
From Liverpool to Leeds, and return, via Bradford.....	128
From Liverpool to London, England.....	201

	Miles.
From London to Dover, England, via Canterbury.....	78
From Dover, England, to Ostend, Belgium.....	80
From Ostend to Antwerp, Belgium.....	70
From Antwerp, Belgium, to Rotterdam, Holland.....	59
From Rotterdam to Amsterdam, Holland.....	50
From Amsterdam, Holland, to Hamburg, Germany, via Han- over	360
From Hamburg to Berlin, Germany.....	176
From Berlin, Germany, to St. Petersburg, Russia....	1, 042
From St. Petersburg, Russia, to Vienna, Austria, via Moscow and Warsaw	2, 063
From Vienna to Trieste, Austria	363
From Trieste, Austria, to Venice, Italy.....	80
From Venice to Florence, Italy	187
From Florence to Rome, Italy.....	233
From Rome to Naples, Italy, and return	326
From Rome to Pisa, Italy.....	216
From Pisa to Genoa, Italy.....	164
From Genoa, Italy, to Lyons, France, via Turin.....	377
From Lyons France, to Geneva, Switzerland.....	106
From Geneva to Basle, Switzerland	175
From Basle, Switzerland, to Frankfort-on-the-Main, Germany.	215
From Frankfort-on-the-Main to Nuremburg, Germany, and return.....	294
From Frankfort-on-the-Main to Cologne, Germany.....	136
From Cologne, Germany, to Paris, France.....	304
From Paris, France, to London, England, via Calais.....	255
From London to Birmingham, England	129
From Birmingham, England, to Cardiff, Wales	150
From Cardiff, Wales, to Liverpool, England, via Chester.....	210
From Liverpool, England, to New York, United States.....	3, 013
From New York to Washington, D. C	228
Total miles traveled.....	15, 321

LIST OF CONSULATES OF THE UNITED STATES VISITED.

The following list will give you at a glance the names of the consulates of the United States visited by me, and also the time of my visit :

Consulate.	When visited.
JAPAN.	
Yedo.	September 28, 29, 1870.
Kanagawa	September 25 to October 1, 1870.
Hiogo and Osaka.....	October 3-12, 1870.
Nagasaki	October 13-15, 1870.
CHINA.	
Shanghai.....	October 17; December 24, 1870. During this time visited North China and the Yang-tsze.
Tien-tsin	October 27, November 20, 1870.
Chec-f6o	November 23, 1870.

Consulate.	When visited.
Chin-kiang	December 1-7-8, 1870.
Han-kow	December 4-6, 1870.
Foo-chow	December 27, 1870, January 3, 1871.
Amoy	January 9-13, 1871.
Swatow	January 14, 1871.
Canton	January 21-23, 1871.
Macao	January 28-30, 1871.
Hong-Kong	January 15, February 1, 1871, including visit to Canton and Macao.
CÔCHIN-CHINA.	
Saigon	February 5-6, 1871.
FARTHER INDIA.	
Singapore	February 9-20, 1871, including visit to Ba- tavia.
JAVA.	
Batavia	February 13-17, 1871.
BRITISH INDIA.	
Calcutta	March 1-4, 1871.
Bombay	March 20-25, 1871.
ARABIA.	
Aden	April 1, 1871.
EGYPT.	
Suez	April 8, 1871.
Alexandria	April 8-15, 1871.
UNITED STATES OF COLOMBIA.	
Aspinwall, (Colon)	June 7-14-15, 1871.
Panama	June 8-25, 1871.
ECUADOR.	
Guayaquil	July 4-5, 1871.
PERU.	
Tumbez	July 1-2, 1871.
Payta	June 30, July 6, 1871.
Callao	July 9-8, 1871.
CHILI.	
Valparaiso	July 27-30, 1871.
URUGUAY.	
Montevideo	August 12-13, 1871.
BRAZIL.	
Rio de Janeiro	August 18-26, 1871.
Bahia	August 29, 1871.
Pernambuco	August 31, 1871.
Para	September 4-5, 1871.

SECOND TOUR OF EXAMINATION.

Consulate.	When visited.
IRELAND.	
Cork	July 9, 1872.
Dublin	July 13, 1872.
Belfast	July 15, 1872.
SCOTLAND.	
Glasgow	July 17, 1872.
Dundee	July 19, 1872.
Leith	July 22, 1872.
ENGLAND.	
Liverpool	July 23-28, 1872.
Manchester	July 25, 1872.
Leeds	July 26, 1872.
Bradford	July 26, 1872.
London	July 29, August 5, 1872. (See England, below.)
BELGIUM.	
Antwerp	August 7, 1872.
HOLLAND.	
Rotterdam	August 8, 1872.
Amsterdam	August 9, 1872.
GERMANY, (NORTH.)	
Hamburg	August 10-12, 1872.
Berlin	August 13-16, 1872.
RUSSIA.	
St. Petersburg	August 19-23, 1872.
AUSTRIA.	
Vienna	August 31, September 2, 1872.
ITALY.	
Venice	September 4, 1872.
Florence	September 5-8, 1872.
Naples	September 16, 1872.
Rome	September 17, 1872.
Genoa	September 21, 1872.
FRANCE.	
Lyons	September 24, 1872. (See France, below.)
SWITZERLAND.	
Geneva	September 26, 1872.
Basle	September 27, 1872.
GERMANY, (MIDDLE.)	
Frankfort on the Main	September 28-29, 1872.
Nuremburg	September 30, 1872.

Consulate.	When visited.
FRANCE.	
Paris.....	October 5-9, 1872.
ENGLAND AND WALES.	
Birmingham.....	October 12, 1872.
Cardiff.....	October 14, 1872.
Liverpool.....	October 15-18, 1872.

COMPLETE LIST OF COMMUNICATIONS AND REPORTS.

The results of my examination into the accounts and business of the consulates of the United States visited by me, personally, and above enumerated, have been given in divers special communications and one general report. As it appears a matter of importance to me personally to show what use I made of my time, in addition to the labor of investigation, I will here include a list of all my communications and reports to date.

List of dispatches addressed to the Hon. George S. Boutwell, Secretary of the Treasury, respecting the condition of the consulates of the United States, by De B. Randolph Keim, agent, &c.

THE EMPIRE OF JAPAN.

Kanagawa, (Yokohama,) September 30, 1870, proposed route of travel and condition of the consulate of the United States at that port.

Nagasaki, October 15, 1870, respecting the consulates of the United States at Hiogo, Osaka, and Nagasaki, and conclusions upon the consular service in Japan.

THE EMPIRE OF CHINA.

Tien-tsin, November 17, 1870, on the condition of the consulate of the United States at that port and consular affairs in North China.

Han-kow, December 5, 1870, on the condition of consular affairs of the United States on the Yang-tsze and at Han-kow, in particular.

Chin-kiang, December 8, 1870, respecting that consulate.

Shanghai, December 22, 1870, respecting the consulate-general at that port.

Shanghai, December 23, 1870, respecting the consul-general.

Foo-chow, December 29, 1870, respecting that consulate.

Amoy, January 11, 1871, respecting that consulate.

Swatow, January 14, 1871, respecting that consulate.

Canton, January 23, 1871, respecting that consulate.

THE COLONY OF HONG-KONG, (BRITISH CHINA.)

Hong Kong, January 25, 1871, on the general condition of the consular service of the United States in China and Japan, with suggestions on the subject; also respecting the judicial powers of consuls.

Hong Kong, January 31, 1871, respecting that consulate.

THE EAST INDIES, (DUTCH.)

Batavia, Java, February 16, 1871, respecting that consulate.

THE EAST INDIES, (BRITISH.)

Singapore, Farther India, February 21, 1871, respecting that consulate.

Calcutta, Bengal, British India, March 4, 1871, respecting that consulate-general.

Bombay, British India, March 24, 1871, respecting that consulate.

EGYPT, (TURKISH DOMINIONS.)

Alexandria, April 14, 1871, respecting consular affairs at the agency and consulate-general of the United States at Alexandria, and generally embracing the entire subject in Egypt.

THE UNITED STATES OF COLOMBIA, SOUTH AMERICA.

Aspinwall, (Colon,) June 15, 1871, respecting that consulate.

Panama, June 18, 1871, respecting that consulate.

PERU.

Payta, June 30, 1871, respecting that consulate.

Tumbez, July 1, 1871, respecting that consulate.

ECUADOR.

Guayaquil, July 5, 1871, respecting that consulate.

PERU.

Callao, July 15, 1871, respecting that consulate, and suggestions for the improvement of the consular service of the United States on the west coast of South America.

Arica, July 1, 1871, respecting that consulate.

CHILI.

Valparaiso, July 29, 1871, respecting that consulate, and further suggestions in relation to the consular service of the United States on the west coast of South America.

URUGUAY.

Montevideo, August 14, 1871, respecting that consulate.

BRAZIL.

Rio de Janeiro, August 24, 1871, respecting that consulate.

Bahia, August 20, 1871, respecting that consulate.

Pernambuco, August 31, 1871, respecting that consulate.

Para, September 5, 1871, respecting that consulate.

Para, September 5, 1871, about the consulate at Maranhão, Brazil.

THE UNITED STATES OF AMERICA.

Washington, D. C., May 22, 1872, a general report upon the condition of the consular service of the United States, and a consular bill.

THE BRITISH ISLES.

Queenstown, Ireland, July 9, 1872, announcing arrival at that port, and the resumption of my investigations into the condition of the accounts and business of the consulates of the United States.

London, England, August 1, 1872, upon the condition of the consular service of the United States in the British isles.

BELGIUM.

Antwerp, August 7, 1872, upon the condition of the consular service of the United States in the kingdom of Belgium.

HOLLAND.

Amsterdam, August 9, 1872, upon the condition of the consular service of the United States in the kingdom of Holland.

GERMANY.

Berlin, August 16, 1872, upon the condition of the consular service of the United States in the kingdoms of Denmark and Sweden and Norway.

RUSSIA.

St. Petersburg, August 22, 1872, upon the condition of the consular service of the United States in the empire of Russia.

AUSTRIA.

Vienna, September 2, 1872, upon the condition of the consular service of the United States in the Austro-Hungarian empire.

ITALY.

Genoa, September 21, 1872, upon the condition of the consular service of the United States in the kingdom of Italy.

SWITZERLAND.

Basle, September 27, 1872, upon the condition of the consular service of the United States in the republic of Switzerland.

GERMANY.

Frankfort-on-the-Main, October 1, 1872, upon the condition of the consular service of the United States in the German empire.

FRANCE.

Paris, October 8, 1872, upon the condition of the consular service of the United States in the republic of France and dominions.

THE BRITISH ISLES.

Liverpool, England, October 16, 1872, supplementary report upon the condition of certain consulates of the United States in England and Wales.

CONCLUDING REPORT.

The present report will complete my labors in this work, and will contain a digest of all that has appeared in previous communications and reports, with a bill proposing a consular service for the United States, prescribing the details of its organization, and the duties of consular officers.

PUBLICATION OF REPORTS.

The act of Congress requires that the reports of the agent or agents appointed to examine into the condition of the consulates of the United States shall be submitted to Congress at the beginning of each December session. In accordance with this provision of the act, my reports, embracing my first tour of examination, were presented complete to Congress in December, 1871, and referred to the Committee on Foreign Affairs of the House of Representatives, and ordered to be printed. These reports will be found in Executive Document No. 11, House of Representatives, second session Forty-second Congress.

On May 22, 1872, I presented a general report entitled "A report to the Hon. George S. Boutwell, Secretary of the Treasury, upon the condition of the consular service of the United States of America," which was submitted to Congress by the President May 24, 1872, and referred to the Committee on Foreign Affairs and ordered to be printed. (See Executive Document No. 317, House of Representatives, second session of the Forty-second Congress.)

The last of the reports of my investigations in the countries of Europe were forwarded to the Department by the middle of November, were submitted to Congress by the President, and referred to the Committee on Foreign Affairs and ordered to be printed.

The present report, I presume, will also be submitted, and I hope will go further than its predecessors, by forming the basis of congressional action upon the much-needed reforms in the consular service of the United States.

A PERSONAL STATEMENT.

In the preceding pages I have taken the liberty of presenting a synopsis of what I have accomplished in the way of travel and in the report of the results of my examinations. I have done this partly in justice to the measure and partly in justice to myself. The idle statements of persons who should have been better informed were calculated to inaugurate the impression that the whole business was a sort of official holiday adventure. The quantity of work accomplished must represent my industry, and the quality must be the vindication of the work itself.

DIVISION OF THIS REPORT.

For the purposes of classification I will confine myself to the following general arrangement of subjects:

PART I.—General consideration of the causes and nature of the irregularities in the consular service of the United States.

Title I.—The causes of the irregularities in, and irresponsibility of, the consular service of the United States.

Title II.—On the nature of the irregularities in the consular service.

PART II.—Propositions looking to the re-organization of the consular service of the United States, and explanatory of the bill hereto appended for that purpose.

Title I.—On home organization.

Title II.—On foreign organization.

Title III.—On the commercial duties of consular officers.

Title IV.—On the duties of consular officers with respect to invoices.

Title V.—On the judicial powers of consuls.

PART I

CONSIDERATION OF THE CAUSES AND NATURE OF THE IRREGULARITIES IN THE CONSULAR SERVICE OF THE UNITED STATES.

TITLE I.—THE CAUSES OF THE IRREGULARITIES IN THE CONSULAR SERVICE.

The present consular service of the United States had its origin in the "act to regulate the diplomatic and consular systems of the United States," approved August 18, 1856. That act was, without doubt, an improvement, as regarded consular affairs, upon what preceded it. It also possessed some provisions which might have tended to the permanent advantage of the service, had it at the same time included the important matter of a directly responsible head.

Since the passage of this act divers new laws on the subject have been added and repealed, old laws have been patched up, until the consular service may be said to have ranged through all shades of legislation. It may be a fitting commentary upon this feature of the service to say that out of the forty-five acts having more or less to do with regulating, changing, enlarging, or modifying the consular service, fourteen are acts of appropriation. If I had the space I might make some curious exhibitions of the consular service on the statute-books. But even admitting that the act of 1856 fully met the demands of the consular service at that time, it is very clear from all that has been said and done in later years that the service has considerably outgrown it since.

THE GENERAL CHARACTER OF THE SERVICE.

On the subject of the general character of the consular service, in my report of May 22, 1872, I alluded to many of the causes which, in my opinion, led to the condition of things existing of late years. I also called your attention to the complaints, at different times, of the Fifth Auditors in your Department. From these, a person could but conclude that the consular duties had, too often to be creditable, fallen into the hands of a set of men difficult to find in any other branch of the civil service. Speaking of the effort to improve made in 1856, I used this statement :

The act of 1856 was doubtless designed to correct the most conspicuous of the abuses which prevailed, by placing certain classes of officers under a more direct responsibility to and control of the Government. The evils existing prior to that time may have been mitigated, or may have experienced a temporary abatement, but from transactions which subsequently came to the notice of your Department, they were certainly not eradicated. It would seem that the act gave rise to new forms of abuses, and these examples, inaugurated at certain places and in certain matters, have been perpetuated in most cases by each succeeding officer.

THE CAUSES OF THE DEFECTS OF THE SERVICE.

The causes which have brought about the demoralization of the consular service of the United States can be summarized under the following principal heads :

CAUSE I.—*The failure to appreciate the real nature and responsibility of the consular office.*

The views generally entertained have been opposed to a consular service on the ground of the consular office being a sinecure. Were these same persons to inquire into the necessities which gave rise, in the first place, to the appointment of consuls at foreign ports, and the multiplication of their duties with the advancement of the commerce of the world; were they even to consider seriously the dignity and importance of the consular office to-day, as compared with the same less than a quarter of a century ago, they would see what a change has taken place, and would probably, now, at least, admit that so far from being a sinecure, it possesses grave responsibilities. Treaties and conventions have enlarged the recognition given to consuls in international law. The privileges which they previously enjoyed, not as a right, but as the result of custom or the legislation of the country, are beginning to be conceded to them, not as consuls merely, but as privileges and immunities belonging to them, as important officers of a foreign state. The time must speedily come, with the steady progress of commercial intercourse, and the closer community of the industrial interests of the different nations of the world, when the consular officer will enjoy, if not fully, in a very little less degree, the inviolability of a diplomatic representative. The abstruse questions of commerce, local regulations, and inland trade, not speaking of innumerable other matters of incidental and daily occurrence, such as the charge of seamen, the supervision of ships' papers, and the execution of instructions on all subjects within his jurisdiction, require more than ordinary ability, and a character of ability, in my opinion, more circumstantial and yet fully as comprehensive as that of a diplomat at court treating upon international questions.

CAUSE II.—*Defects in the consular laws arising from a lack of practical knowledge of the actual wants of the consular service. To this might be added legislation upon ill-advised suggestions by persons not sufficiently comprehensive or practical in their views.*

It is true there have been a great many laws passed on various matters relating to the consular service. In my opinion there is too much law already upon some matters, and not enough, or practically none at all, in the very important feature of giving direct authority to some officer or special bureau to act and to enforce the laws in existence. The present system, as it works practically, would seem to be on the principle of everybody for himself. The only check upon a wholesale appropriation of the fees, or a reckless disbursement of the seamen's fund by some officers, has been the constant suspicions of bureau officers, whose long experience in the divers dodges and expedients often resorted to, has made them not over-ready to pass accounts. The injustice of such a course will be seen. The rascality of one unworthy officer must act to the disrepute and disadvantage of any number of worthy ones. At the best, this system must be the work of mere guessing.

In regard to the other part of the above cause, I can give no better example than the impracticability in some respects, the questionable economy in others, and, in the third place, in one particular feature the inconsistency of the act of Congress approved July 1, 1870, entitled "An act to amend an act entitled 'An act to carry into effect provisions of the treaties between the United States, China, Japan, Siam, Persia, and other countries, giving certain judicial powers to ministers and con-

suls, and other functionaries of the United States, in those countries, and for other purposes,' approved June 22, 1860." This act was, I have been informed by the gentleman himself, prepared by the consul-general of the United States at Shanghai, China, Mr. Seward. A perusal of the third section is a very fair index to the bill as a curiosity in its way.

CAUSE III.—*The effort to make the consular service a source of revenue by the payment of inadequate salaries to consular officers.*

I have seen it stated, as a matter worthy of considerable congratulation, that the consular service of the United States pays. It may bring a few extra dollars into the Treasury, but in the way it has been conducted all along it has taken many more thousands out. It has been a burden to our shipping by various personal impositions, and it has disgraced us in a national point of view beyond estimate.

CAUSE IV.—*The absence of a bureau organization at home, with a superintendent to have direct control over all financial and commercial matters relating to the consular service.*

The home business of the service at present hangs between two Departments, of State on the one hand, and the Treasury on the other. It would be next to impossible to define precisely the jurisdiction of either Department. The Treasury Department, in general, is charged with the collections made by the consuls in return for the performance of official duties. It audits and settles all accounts of consular officers, and has charge of all returns of fees which are made to the Secretary of the Treasury. The consul is emphatically an accounting officer of the Government, receiving fees for certain official services, and thus a revenue; and also he is a disbursing officer, expending considerable sums in the interests of American seamen. In all these matters he is required to keep accounts, and to make returns of amounts received and expended, and, for the faithful performance of this trust, he is responsible, naturally, to the Secretary of the Treasury. The consul is also a commercial agent, and, as such, should be held directly under the Department having special control of the commercial interests of the country.

In no sense can the consul, by virtue of his appointment, be regarded as a diplomatic officer. In my opinion it would be extremely advantageous were the jurisdiction of consular officers, in all matters pertaining to their consulates and their duties in the interests of commerce, transferred to the Department of the Treasury, and placed under the direct control of a bureau specially created for the purpose. By a law of 1854, the consular service of the British government was placed under the general superintendence of the board of trade, that arrangement, after long experience, having been found more consistent with the real nature of the consul's business.

I do not believe it desirable, or even practicable, in all matters to confine the consular service exclusively to the Treasury Department. I do believe, however, in having a single head, and, as the duties belong more particularly to commerce and accounts than to diplomacy, that head should be an officer of the Treasury Department. Consular officers exercising political or quasi-diplomatic functions, or the right to correspond with governors of colonies, should continue in such matters, and solely in such matters, to address the Secretary of State.

In my report of May 22, 1872, this subject was fully considered. I will

here make a few extracts from my remarks on the question of Department organization:

The first most serious objection that I see to the present consular service of the United States is the entire absence of any officer specially invested with authority over consular officers and their business. Those engaged in the faithful discharge of their duties have repeatedly mentioned to me that they hardly knew to whom they were responsible. It was true, they admitted, that the regulations conveyed instructions in regard to this question, but that they were frequently advised one way by one Department, and perhaps by the next mail received just the reverse instructions from the other. This is not extraordinary, when we consider the opposite duties of the two Departments. If a question of diplomacy were to be referred to the Treasury for consideration, the subject would certainly not receive the attention which would be the case at the hands of officers specially qualified and versed in such matters. For the same reason a question of commerce, revenue, or accounts would be equally out of place in the Department of State. It is upon this ground that I should recommend the concentration of the authority over the consular service in its general duties in one Department.

It will only be necessary to give here a list of the returns and accounts to be transmitted by consular officers to the respective Departments, State and Treasury, in order to show the incongruity of the present arrangement.

To the Department of State consular officers are instructed to transmit the following returns: *Quarterly*—a copy of the invoice-book, register of official letters received, register of official letters sent, arrivals and departures of American vessels, return of deceased American citizens, and returns of navigation and commerce; *semi-annually*—an abstract of passports issued; *annually*—the names of the persons employed at the consulate, and a statement of the aggregate amount of fees received.

A quarterly account is also required of rent and miscellaneous expenses with vouchers.

At the same time returns and accounts are required to be transmitted to the Fifth Auditor of the Treasury, as follows: *Quarterly*—a record of Treasury fees, with oath; a list of seamen shipped, discharged, or deceased, at the consulate; statement of relief to seamen, return of extra wages, fees received on account of vessels, statement of fees not contained in form No. 96, and hospital dues collected during the quarter; quarterly account-current to be accompanied by vouchers and certificates, as per forms specified, and quarterly salary-account, with certificate of non-absence and vouchers in case of sale of draft, as per forms specified.

In reflecting upon this division of the consular business between the Departments, it will be seen that with two exceptions these returns belong in their very nature to the Treasury. An invoice is a declared statement of the value of certain goods imported from a foreign country with a view to the payment of customs. All matters of customs belong to the Treasury; it therefore requires no argument to show that the copy of the invoice-book should go to that Department. It is the province and a necessity of that Department to know the values at which imported articles are being invoiced.

The registers of official letters received at and sent from the consulate are merely incidental to the business. The returns of arrivals and departures of American vessels, and of navigation and commerce, are devoted to a field of information and industry of peculiar importance to the Treasury. The aggregate of fees received sent to the Department of State is superfluous, as a sworn copy of the record is sent to the Fifth Auditor of the Treasury. The accounts of rents and miscellaneous expenses, though required to be sent to the Secretary of State, have finally to go to the Treasury for audit and payment. I even learn that part of these rents are paid directly from the Treasury. The confusion which must result from this can easily be imagined. If two rents are not often paid to the same consulate it is certainly no fault of the system.

In my judgment, all rents should go at once to the Treasury and be paid through the consular bureau proposed. The names of persons employed at the consulate should also unquestionably be sent to the Treasury, where they are paid, instead of to the Department of State.

The return of deceased American citizens should also go to the Treasury, where the proceeds of the estates of American citizens dying abroad, leaving no legal representatives, are sent, and the amounts paid over to their relatives and friends. The names of such citizens should be published by the Secretary of the Treasury.

This last observation would apply with peculiar force to the deaths of American seamen. Other inconsistencies might be mentioned, but the above are sufficient to explain this cause of embarrassment.

CAUSE V.—*The frequent filling of the consular offices with unsuitable or incompetent officers.*

No one can dispute the fact that many unfit persons have at different times secured places in the consular service. Among these, often, were those who knew beforehand about as little of the office and its duties, and with as little ability to learn, as it would be possible to conceive. It would be fair to presume that this class went out without any previously set plans of honesty; and, uncertain as to their lease of office, set to work at the earliest moment to make all they could, regardless of law, regulations, or personal reputation. From the subsequent history of this class, it is due to them to say that if they did not dignify the service by their presence, they certainly added to its notoriety, and pointed out its defects.

The officers, as a rule, at the time of my visit, had been obliged to open their books anew, or had had it done by a subordinate. Almost every consulate had some defects in its history, owing to the incompetency, low habits, and vulgarity of some of its officers, during the endless round of evils incident to official rotation. Abuses had been committed in the collection of fees, in the exercise of judicial powers, in the adjustment of the business affairs of American citizens, in the settlement, where permitted, of the estates of intestate American citizens dying abroad, in selling the American flag, in "running out" ships, in the discharge of seamen, in affording relief or medical attendance to destitute or sick American seamen, in issuing illegal passports, in countenancing shipping-masters, in taxing Chinese emigrants. Indeed, the most interesting feature of my investigations was the ingenuity displayed by consular officers, since the act of 1856 particularly, in defrauding the Government and grasping gains from various outside sources besides. My report of May 22, 1872, Part III, is filled with instances which prove the truth of these remarks.

CAUSE VI.—*The transient nature of the service, which tends to make officers either indifferent or indiscreet.*

CAUSE VII.—*Illiberality in salaries paid and allowances for office expenses and furniture.*

It would not be speaking too forcibly to say that, as a rule, the amounts paid for salaries to consulates are just sufficient to make the officer keenly feel and appreciate his degradation when brought in contact and comparison with his colleagues of other nations. His salary compels him, if he be without means of his own, and at the same time honest, to live in unsuitable quarters, and to eke out a careless, wayward sort of an existence, which often runs into low habits. The pay is insufficient, as a rule, to secure the services of persons of scholarly attainments or social standing, and, as a consequence, we have a display of American character by no means creditable. If the Government pays starving salaries, it is too much to presume that the men who fill the offices will starve for the sake of honesty.

CAUSE VIII.—*The granting of relief to destitute American seamen at foreign ports without the means of checking speculation, perjury, and fraud in the use of the fund for this purpose.*

There is no branch of the consular duties which has been put to greater abuse than the humane provisions of the Government to protect its destitute seamen cast upon a foreign shore. My report of May

22, 1872, Part III, as well as my special communications, are filled with instances of the downright rascality which has been practiced in this matter of relief. Large sums have been charged, and vouchers, explanations, and affidavits have been heaped upon the Department by the ream, and have been paid when the accounting-officers in the Department have no doubt thought that they were questionable. There is nothing in the law to authorize an officer to dispute an account which is in due form and against which no circumstantial objection can be found. In my general report I explained the process of securing vouchers for the relief of destitute seamen on the west coast of South America. When natives can be hired at low rates to accept relief and sign vouchers, there is no difficulty in the way of the consular officer exercising his humanity and reaching the Treasury in the most unabashed manner. On this same west coast of South America, where the commerce of the United States is smaller than that of any other part of the globe of equal importance, the expense of relief has amounted to as high as two-thirds and three-fourths of the entire sum thus expended by the Government. No one can be so credulous as to believe that there could be such a disparity of commerce and expenditures with an honest use of the fund. If this money were applied as I found at some ports, the Government would not have been at an expense ranging from \$60,499 in 1871 up to \$220,982 in 1860. The laws for the collection of the extra wages, which should go to this relief fund, are explicit enough, but I have found no uniform practice in their application. At some places I found the extra wages apparently had been collected in every case, and accounted for to the Government; at other places they had either not been collected at all, or had been appropriated by the consular officer, and the Government at the same time was charged with the expense of relief. I could mention instances, in any number, of the dodges and schemes resorted to by officers to reach this relief fund, and the success of these are not only perplexing to the officers of your Department, but absolutely provoking, when we consider the helplessness of the Government in striving to protect itself under the present system.

What check has the Treasury against these inroads? Absolutely none at all. No one save the author of the present laws would presume that the sending of a list of arrivals and departures of American vessels to the State Department, or a list of seamen shipped and discharged, or deceased, or a statement of relief of seamen and extra wages received, to the Treasury Department, would accomplish anything, or give the Auditor (Fifth) or Comptroller any sort of sensible information for the purposes of detecting peculation or irregularity of any kind. Such a system must strike every one who contemplates it for a moment as a burlesque upon official accountability. The trouble is not concerning the relief accounted for, because there would be no end of that, but as to how much is genuine and how much spurious. With a special bureau organization at home to manage consular affairs, I can see much good. There would then be a special officer in charge. A detailed account of each seaman relieved should be required. The name and description of the ship, her voyage, her owners, her home port, and everything tending to the identity of the man and vessel, should also be demanded before any accounts were passed. The bureau, through the collector of customs or his officers, could then trace up any case. By multiplying the dangers of peculation, and the probabilities of discovery, we naturally lessen the amounts thus illegally extracted from the Treasury.

The appended bill contains the plan I consider better adapted to secure accountability in the disbursements on account of relief, than the unjust, unequal, and irresponsible method now in vogue.

I might extend my observations upon the irregularities, irresponsibility, and unaccountability of the present consular system of the United States to an indefinite length. There is hardly a feature in it that does not indicate imbecility in point of executive force, humiliation in point of character, and mingled extravagance and penuriousness in point of practice. I do not consider myself, in the least degree, overstepping the bounds of decorum or of justice when I say this. I admit that there always have been some and perhaps a great many suitable persons filling the consular offices. I am of the opinion, as a class, they are infinitely better now than at any one time before. This the financial exhibits prove, and so do my own statements from personal experience. Yet the service itself is no better than before. The laws are more faithfully applied, but evils still exist, and always will while we have the present system.

CAUSE IX.—*The want of an officer resident in the country with supervisory powers over consular officers.*

CAUSE X.—*The want of a simple and temporary consular tribunal readily organized for the trial of consular officers at a foreign port or place.*

CAUSE XI.—*The want of a proper officer connected with the consular bureau to receive and to consider all complaints respecting the conduct, personal or official, of consular officers, and to secure prompt investigation, and, if guilty, summary punishment.*

I would state in connection with the eleventh cause that I should infer that it has been the practice of the Department in charge of consular officers to forward all complaints to the officers concerned. The effect of such a course is easily to be seen. If a consul is given to intemperance, (and this is no rare predilection,) or any other improper conduct, a complaint made is sent by the Department to the consul accused. In possession of the names of the parties who have thus exposed his unbecoming behavior, the consul immediately, without any further thought of the Government, sets up a system of persecution of the unfortunate person or persons thus dealt with. I am satisfied that repeated altercations have occurred between officers and citizens on no other grounds.

In my opinion it should be the province of every citizen of the United States to make complaint of the improper conduct of officers to the Government without being exposed in this inexcusable manner to the wrath of the accused. When consuls know that there is a tribunal to consider their delinquencies, and that they are in some way accountable, those who require such supervision will get it, and if their own self-respect will not keep them within reason, the Government will be able to make room for better men to take their places.

CAUSE XII.—*Neglect or inability to punish consular officers guilty of offenses.*

CAUSE XIII.—*The continued enforcement of obsolete laws and consular forms.*

As I will have occasion to allude to these subjects in the course of my explanatory observations respecting the provisions of the consular bill hereto appended, I will omit further discussion of them here.

TITLE II.—ON THE NATURE OF THE IRREGULARITIES IN THE CONSULAR SERVICE OF THE UNITED STATES.

In the third part of my report of May 22, 1872, I mentioned at length some of the irregularities I found existing in the service in Asia, Africa, and South America, and in my communications from Europe during the past summer made the same a subject of consideration respecting that part of the globe. As I have determined to make this more an abstract or digest of all my preceding reports than a statement of new facts, I will merely confine myself to deductions rather than to details, hoping those interested in this important matter may find it convenient to refer to my full reports.

CLASSIFICATION OF IRREGULARITIES.

The irregularities in the consular service may be classified as follows: First. Neglect of duty, either from incompetency or willfully.

Secondly. In the charging and accounting for consular fees.

Thirdly. In the relief of destitute seamen, and in the receipt of extra wages.

Fourthly. In the exercise of judicial powers by consular officers.

Fifthly. Respecting invoices.

Sixthly. In the use of the consular office for personal gain or advancement.

Under the first of these heads may be classed, neglect of duty from intemperance or indolence. It is beyond dispute, that ever since the existence of a consular service under our Government, persons have succeeded in getting into the offices who never had any fixed rules of sobriety; who never had any known occupation, nor consequently visible means of support. From such a set, the least expected the better. Probably, in equal proportion to the above, were those incompetent to perform their duties. Another class, but in less proportion, were those who, with ability and accepted character at home, lost all restraint abroad. And last, and I regret to say least in proportion to the whole, have been those in every sense worthy of the dignity, intelligence, and superiority of the American name.

In my report, speaking of these grades of persons who have held office, I speak at some length, either from my own experience or that of others. Page 82 of report of May, 1872, (Ex. Doc. No. 317, H. R. 2d sess. 42d Cong.,) gives an instance by way of illustration of the first. The second was exhibited in the condition in which I found the books, that is, the neglect which, at times, I found had extended to an absolute abandonment of all accounts. The third class may be best exhibited in the words of another. In regard to the condition of the service prior to 1861, Mr John C. Underwood, Fifth Auditor of the Treasury, in his official report, dated November 29, 1861, says:

I regret to be obliged to state that some of our consulates seem to have been exposed to considerable peculation from our own agents and officers. Although these officers are required by law to report quarterly, I found, on entering upon the duties of this office, that the last salary-report of the consul of so important a port as Liverpool was made March 31, 1858, and that the consul then acknowledged a balance in his hands of \$2,929.83. Since then he had strangely been permitted to hold on without reporting, spending all the funds he could reach, neglecting the payment of claims for food, clothing, and medical attendance of our sick and destitute seamen, and, by a course of plunder and profligacy unequalled in our consular history, contracting public and private debts, which, I am informed by a neighboring consul, probably exceed \$200,000. It is perhaps some consolation to know that this plunderer no longer disgraces the Government abroad.

* * * * *

Justice to my predecessor requires me to add that reports were made to the proper authorities of the delinquencies of the consul to Liverpool, without producing any decided action.

To quote from my own report:

It strikes me that a majority of the persons filling the consular offices, unable or unwilling to appreciate the importance of their position in the eyes of the community in which they reside, as soon as they get beyond the restraint of public opinion at home, cut loose from all moral obligations, and act in a manner as astonishing to themselves, I should say, as it is to the calm judgment of those who are able to preserve their self-respect without the influence and assistance of home opinion. It has often happened that officers have ignored all remembrance of the commission which they hold, and forget that, as Americans, they are taken as representatives of their countrymen. I have repeatedly heard complaints from consular officers that they do not receive the common civilities of American travelers. Taking some officers that I have seen or heard of, this attitude of personal relations is not extraordinary.

Of the last class, the really creditable officers, their own merits are the vindication of their work, and to secure such persons throughout it is only necessary to elevate the service by protecting it from the marauders who frequently take possession, and to pay such salaries in all cases as would secure ability and fidelity.

CONSULAR FEES.

Under the head of fees it would be unnecessary to state that many complaints have been made of overcharges. I have not the least doubt in most cases these complaints are well founded; but they are difficult to prove. In all the consulates, judging from my own knowledge, I think I can safely say not one in twenty has a table of fees posted, so that they may be seen. In my opinion every official paper should have the fee marked on it, requiring complaint of any amount charged in excess. In the returns of fees the exhibits of the past three years have been more flattering than ever before. The practice often resorted to by consuls in driving business from their own offices to their agencies, in order to secure the benefit of the law which allows them \$1,000 a year out of the aggregate fees received at such agencies, is also a common abuse. The following from my report of May, 1872, will show a comparison of fees received for twelve years:

2.—*Total amount of fees received, and excess of receipts or expenditures.*

For the fiscal year ending June 30—	Total amount of fees received.	Balance paid by the Treasurer of the United States,	Excess of receipts over expenditures.	Total.
1860.....	\$110,896 78	\$152,310 20	.....	\$263,206 98
1861.....	99,113 23	160,410 04	.....	259,523 27
1862.....	77,590 21	212,273 41	.....	289,863 62
1863.....	152,982 94	252,417 43	.....	405,400 37
1864.....	254,218 34	109,561 65	.....	363,779 99
1865.....	287,108 00	71,653 64	.....	358,761 64
1866.....	442,477 56	.....	\$91,906 62	350,570 94
1867.....	424,099 17	.....	42,088 77	382,010 40
1868.....	435,179 73	.....	61,428 84	373,750 89
1869.....	459,722 43	.....	75,722 54	383,999 89
1870.....	534,670 79	.....	73,706 20	460,964 59
1871.....	632,258 22	.....	147,619 59	484,638 63

NOTE.—Fees returned for 1860 and 1861 extend respectively to December 31, 1859 and 1860.

THE RELIEF OF SEAMEN.

I have already called attention to the fact of the fund for the relief

of destitute American seamen abroad being the most fruitful source of speculation.

The act of 1803 and other acts define the meaning of an American seaman, and make provisions for his discharge and relief. These acts make the master of a vessel of the United States responsible for the return of all of his ship's company to the United States, or of accounting for them in the manner prescribed by law.

THE COLLECTION OF THREE MONTHS' EXTRA WAGES.

By provision of law, it is the duty of all consular officers of the United States, when seamen of the United States are discharged, for the reasons given below, to collect of the vessel three months' pay over and above the wages which may then be due to such seamen. These collections may be made as follows:

First. When a ship or vessel belonging to a citizen of the United States shall be sold in a foreign country, and her company discharged.

Secondly. When a seaman shall, with his own consent, be discharged in a foreign country.

Thirdly. When a vessel has been condemned by inspectors.

Fourthly. On the complaint of a seaman that the voyage is continued contrary to his agreement, or that he has fulfilled his contract, the same to be determined by an examination of the facts by the consular officer.

There are also cases in which extra wages shall not be collected.

RELIEF OF DESTITUTE SEAMEN.

Of the extra wages collected, except in certain cases, mentioned in the laws and regulations, one-third goes to the United States and two-thirds to the discharged seaman. The one-third forms a fund in the possession of the Government, to be disbursed, under certain defined rules, for the relief of American seamen destitute in a foreign port, and who may seek the consulate for support and shipment home.

ABUSE OF THE RELIEF FUND.

It is without question that the most outrageous frauds upon the Government have been perpetrated by consular officers in the use of this relief fund. Overcharges, false vouchers, and every other means which dishonesty could devise have been resorted to to get hold of the money thus dedicated to this most laudable act of humanity.

RELIEF ACCOUNTS IN ASIA AND EGYPT.

I found at most of the consulates of the United States, in Asia and Egypt, what I consider a reasonable expenditure on account of the relief of destitute American seamen. In two instances, since my visit, these amounts have fallen off, at the same time the amount of shipping has increased.

At Calcutta, British India, I discovered, notwithstanding the revival of trade since our late rebellion, that the amount expended during the two years previous to my visit for the relief of destitute seamen was comparatively small. In regard to American vessels and sailors, the consul-general complained that he had been at no small amount of difficulty to preserve order among the sailors, and to keep peace with the local authorities.

STATEMENT OF THE RELIEF ACCOUNTS IN SOUTH AMERICA.

The following general statement of relief at the consulates of the United States in South America will show the totals for the three years ended June 30, 1871. With the exception of Aspinwall and Panama, my investigations did not commence until after the close of the fiscal year of 1871. At the two ports named, there are certain circumstances which might afford some excuse for the amount expended, particularly at Aspinwall, which are from \$141, in 1870, to \$995.65 in 1871. The Isthmus is the great thoroughfare from California, the west coasts of Mexico, Central and South America, to the United States. The demands, therefore, upon the consulate are liable to considerable change from year to year.

I would, however, call your attention specially to an increase of expenditure at the following points:

Guayaquil.—The expenditures at this port are out of all reason, upon the grounds that there is absolutely no American shipping worthy of the name. The statement that seamen come there from other ports for relief I do not believe, for the reason that access to the port from up or down the coast by land is almost impossible.

At *Tumbez* the peculation which has been going on, through false vouchers and other means, is evident by the sudden fall in the expenditure from \$3,646.12, in 1870, to \$204.25. The latter is, perhaps, a reasonable allowance. I consider this decline chiefly influenced by the intemperate habits of the late consul, which fact disqualified him from keeping his accounts.

The appointment of a new officer, a resident at the port, will, it is to be hoped, permanently remedy the evils which have existed.

At *Payta* the greatest frauds have been committed for some years, under the plea of relieving seamen from whale-ships. I may say it is my belief, after careful investigation, that not one voucher out of ten is an honest statement of a *bona-fide* expenditure. The port has no trade with the United States, and the number of whale-ships arriving there is small. As the town is surrounded by a desert, it furnishes neither wood nor provisions, nor even water. It will be seen, too, that the expenditures at Payta, with no commerce, exceed the port of Callao, where there is a large American trade.

The same could be applied to *Talcahuano*, where, I am of opinion, irregularities are also being constantly perpetrated.

At the ports in Europe visited by me, I found a quite reasonable expenditure, though the trade was large. There are ports, *Fayal* and *Malaga* for instance, where the expenditures are unnecessarily large. I regretted that within my limited time I could not reach those consulates and examine their accounts. The recommendations, however, which I will have to make will control the expenditures there as well as elsewhere. While speaking on this subject, I desire to quote here from the reports of some of the officers of your Department.

Fifth Auditor Underwood, in his report of November 29, 1861, above quoted, says:

Some of the consulates on the Pacific coast and islands need investigation and reform. In four of these consulates, the disbursements for the relief of seamen during the year embraced in the last report from this office exceeded \$114,000, and were about \$8,000 more than the disbursements of all our other consulates reported during the same year.

After showing a diminution in this class of expenditures, this officer continues:

But we have been unable to effect a radical cure of the chronic difficulty. In these

distant consulates there are both temptations and facilities for procuring fictitious vouchers, and the correctness of papers on the face is generally in proportion to the enormity of the frauds they cover. Nothing short of the supervision of an officer of capacity and competent authority will be able to complete the necessary reform. When by proper safeguards our consuls shall be relieved from all temptation to devise ways and means to reach the Treasury by fraudulent vouchers, they will have more time to attend to their legitimate duties, and we shall have reason to expect that the real wants of our seamen will be better supplied, and the receipts for seamen's wages will be increased.

The report of the Fifth Auditor, dated October 18, 1869, says :

In the matter of accounts for the relief of seamen, flagrant abuses exist, many of which can only be detected and corrected by personal visits to consular offices, and inspection and investigation by those familiar with the service and the mode of making up these accounts and vouchers.

I will not at this place make use of many figures, as I will have occasion for them again in explaining the provisions of the accompanying bill on the subject of relief. But, by way of comparison, I would call your attention to the following exhibit from official sources :

1871—Europe.	Disbursed.	Received.	West coast South America.	Disbursed.	Received.
Liverpool.....	\$2, 116 03	\$3, 973 55	Talcahuano.....	\$5, 829 72	\$1, 439 00
London.....	325 29	30 00	Payta.....	4, 229 89	440 00
Havre, (1870).....	421 75	278 38	Tumbez, (1870).....	3, 646 12	481 00
Havre, (1871).....	296 34	194 97	Tumbez, (1871).....	204 25	100 00
Hamburg.....	26 00	115 08	Guayaquil.....	1, 082 46	Nothing.
Total.....	3, 185 41	4, 591 98	Total.....	14, 992 44	2, 460 00

The above ports are the most important in Europe and the least important on the west coast of South America, in a commercial point of view. I think it would be safe to say that at least seven hundred vessels arrived at the former ports, while not one-tenth of that number arrived during the same time at the latter.

Notwithstanding this, at the European ports named, \$3,185.41 were disbursed for relief, and \$4,591.98 received on same account, against \$14,992.44 disbursed, and \$2,460 received, at the west coast ports of South America, for the same period.

I would also particularly call attention to the accounts at Tumbez. Here, in 1870, \$3,646.12, with the second quarter of 1870 not received, were expended for relief, while the next year the amount fell to \$204.25. This difference I account for in the fact that up to the time of my visit a most disgraceful condition of things had existed at that port.

The officer then holding that place was removed. I gave at the time a full account of his performances and those of his predecessors. I would particularly call attention to the contents of my report of May, 1872, page 142 to 158.

In Europe the consulates most doubted in the regularity of their relief accounts, are Malaga, in Spain, and Fayal, in the Azores. This portion of my bill will have in view the establishment of a more equitable method of supplying the relief fund with means, and a more accountable disposition of this fund for the benefit of destitute American seamen.

JUDICIAL POWERS OF CONSULS.

The next irregularities I found to exist were in the exercise of judicial functions by consular officers of the United States in China and Japan and other countries. In my report of May, 1872, page 159 to 166, and page 249 to 261, I treated upon this subject. The defects and the

methods of improvement which presented themselves to my mind, I mentioned there. All that I will have to say here on this important matter shall be to repeat the following words from the above report, pages 249, 250 :

THE POWERS CONFERRED BY THE JUDICIAL ACT OF 1860.

The provisions of the act of June 22, 1860, with regard to Japan and China, notwithstanding the imperfection of the Japanese treaty, have since been exercised to the fullest extent by consular officers in both countries. The settlement of disputes involving pecuniary and personal interests, frequently of no small moment, has been the least of these powers. The consular officer is also empowered, with the assistance, in certain cases specified, of not to exceed four reputable fellow-citizens residing at the port, to determine cases of property and crime involving crimes and imprisonment, and capital offenses punishable with death, the execution of the criminal alone requiring the approval of the minister of the United States residing in such country.

To thus have the property, the lives, and liberties of American citizens in their hands, is intrusting the highest functions to officers separated from the Government by thousands of miles. Yet such are the powers conferred upon and exercised by consular officers of the United States in China and Japan. It would be impossible to conceive how much injustice has been done through ignorance or indifference, or how much oppression has been practiced through dishonesty and greed. That instances of abuses from these causes have occurred there can hardly be a doubt. My own examinations have shown this sufficiently to leave no uncertainty on the subject in my own mind.

The two points at which the largest amount of judicial business devolves upon the consular officers are Kanagawa, (Yokohama,) Japan, and Shanghai, China. At the other ports of both countries this duty is of importance only in proportion to the extent and character of American interests. More frequently these disputes are determined by the simpler and more desirable means of arbitration. I have sometimes thought, in the course of my investigations into consular judicial matters, that the responsibility of the consular officer in Japan and China has never been entirely appreciated at home.

The conduct of the officer at Kanagawa, (Yokohama,) Japan, at the time of my visit in 1870 was fully reported by me. The appointment of a new officer was in every sense advantageous to the interests of the Government at that important port.

INVOICES.

On the subject of invoices, I am of the opinion there is a general disposition on the part of consular officers to execute the laws, but I found at the principal offices in Europe there existed considerable confusion as to the interpretation of the laws. With some modification of, and addition to the laws and regulations, and a clearer setting forth of the duties of consuls in the premises, I think this portion of the service would be made more effective and intelligible. In order, however, to expect and to secure harmony of action, it would be even more necessary than a change of the laws, to enforce my plan of establishing a special bureau for the consular service, and to place everything relating to invoices under the supervision of that bureau. At present, a most conflicting and contradictory course is pursued in this matter.

Naturally, invoices belong to the Treasury, and for their correctness, &c., officers should be held responsible to the Secretary of the Treasury supremely, and be under the supervision of a special officer subordinately. In my communications from the British Isles I spoke of the legalized extortion practiced upon persons bringing invoices for verification, by first compelling them to pay a fee to a commissioner for administering the oath, and, in addition, requiring them to pay the just fee of \$2.50 to the Government. In treating of that portion of the appended bill relating to invoices, I will present the subject in detail.

ABUSE OF CONSULAR POWERS.

I will but mention the other instances of irregularity which came to my knowledge, as some of these were more the abuse of the powers vested in the consular officer than a violation of the law itself, while others involved both. If I were to make any more than allusion to them, I would be compelled to exceed greatly the space which I have allowed to this report. I will mention the subject with a reference to my report of May 22, 1872, (Ex. Doc. No. 317, H. R., 2d sess. 42d Cong.:)

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NO CONSULAR OFFICER EVER PUNISHED.

To cap the climax of all, I am not aware of a single case of formal investigation and punishment of a consular officer for his offenses. Even removal from office, where made, has been as a rule extremely tardy. I am, therefore, not surprised at the temerity of officers in the unfaithful performance of their trusts.

CONCLUSION.

For the benefit of those who may wish to pursue their investigations more in detail respecting the consular service of the United States, I will here take the liberty of referring them to my report of May 22, 1872, (Ex. Doc. No. 317, H. R., 2d session 42d Congress.) The suggestions of consular reform will be, however, somewhat modified and improved in the present report, but the materials which have formed the basis of these suggestions are the same.

PART II.

PROPOSITIONS LOOKING TO A RE-ORGANIZATION OF THE CONSULAR SERVICE OF THE UNITED STATES AND EX- PLANATORY OF THE BILL HERETO APPENDED FOR THAT PURPOSE.

TITLE I.

On the subject of the laws relating to consular affairs, in my report of May, 1872, I expressed the following views:

The consular service of the United States is embraced in sundry acts of Congress commencing as early as 1792. The number of these acts, and frequently the diversity of subjects treated upon in them, have created a degree of confusion which has in no small measure added to the embarrassments experienced both at home and abroad. In some instances, as in the particular act of 1856, the consular service has been a subject of special enactment. But for consular changes in the way of repeals of other acts or parts of acts, or additions or modifications which have been incorporated into acts having no direct reference to the subject, I have but to refer specially to such repeals and changes in the workings of the service carried through in appropriation bills. I should urgently recommend the repeal of all laws relating to the consular service, and the passage of one complete bill covering the whole ground. For this purpose I take the liberty, in a subsequent portion of this report, of submitting a bill containing such amendments as have occurred to me as necessary to the promotion of the efficiency of the service, and embody in the new bill such portions of the old as I think advisable to retain. I should recommend the bill alluded to as having, in my opinion, in part an advantage over the old system, particularly in the features of organization at home and abroad, and in the more detailed and comprehensive provisions for the carrying into effect of the treaties with China, Japan, and other pagan countries, according judicial functions to consular officers. In its general features it will also have the merit of bringing the whole subject into one bill.

The subsequent pages of this report, therefore, will be explanatory of my reasons for the more important provisions of the bill which I have the honor to submit.

TITLE II.—ON HOME ORGANIZATION.

In the first part of this report I alluded to the embarrassment experienced from the present division of the consular service between the Departments of State and the Treasury.

In the former Department the service is under the direction of two consular bureaus, and in the latter the accounts are audited and settled respectively by the consular divisions of the bureau of the Fifth Auditor and the office of the First Comptroller. I attribute all the lack of accountability in, and effective administration over the consular service to this distribution of authority.

For instance, should the assessors and collectors of internal revenue be appointed by the Secretary of the Interior, should the rents of offices and incidental expenses be under the supervision of that Department,

and should these same officers be compelled to make a statement of their tax-books to the same Department, and return all taxes received to the Treasury, and further, should these officers receive instructions from both Departments, it would be difficult to conceive the confusion or to estimate the losses which would annually fall to the lot of the Government. Officers would find opportunity for practices which, under such a division, could easily elude notice.

This principle has worked the demoralization of the consular service.

The internal revenue of the country is intrusted to the direct management of a single head, responsible to the supreme authority of the Secretary of the Treasury. In unity of action there is strength. The Commissioner has under his supervision all the officers of his vast bureau, and it is he who is responsible for any inefficiency in the service, from any decrease, all things being equal, in the revenue from internal taxation.

Consular officers are as much accounting-officers as are assessors and collectors. In the first case the returns are receipts from consular fees, in the second, receipts from internal taxes.

The same success which has attended the administration of the internal revenue laws under a single Commissioner would, unquestionably, attend the consular service under a single superintendent. As far as this part of the principle is concerned, in order to secure a consolidation of the service under one head, subordinate only to the Secretary, it would almost matter little in which Department the bureau were established. Although as accounting-officers, the work of accounts and invoices—that is, all matters relating to salaries, fees, relief of destitute American seamen, and instructions respecting invoices, which belong to revenue from imports—could, unquestionably, be more satisfactorily transacted in the Treasury Department.

For the same reason, any questions of a diplomatic nature, or any consuls in the exercise of judicial powers, should on such subjects continue to address their communications to the Secretary of State. A proposition so self-asserting in its application scarcely needs as much vindication as I have given it.

CONCERNING A DEPARTMENT OF COMMERCE.

A plan which I should prefer to the one which I have in view would be the creation of a department of commerce, to have charge of all matters relating to our internal and external commerce. To that department I should then recommend the assignment of the consular service, its officers, and their duties.

EXPLANATIONS OF THE PROVISIONS OF CONSULAR BILL.

The first parts of the bill (Sections I to VII) are devoted to some necessary preliminaries, repealing certain laws, continuing others, definition of terms, &c.

BUREAU OF THE CONSULAR SERVICE ESTABLISHED.

The home organization of the consular service is inaugurated by the establishment of a bureau of the consular service, (Section VIII.)

Section IX provides that the said bureau shall have charge of all matters not diplomatic and pertaining to the duties of consular officers.

SUPERINTENDENT OF THE CONSULAR SERVICE TO BE APPOINTED.

Section X designates the principal officer as the superintendent of the consular service of the United States, and defines how he shall be appointed.

Section XI designates the subordinates to be attached to the bureau.

Section XII designates and fixes the salaries of all officers and employés of the bureau.

Sections XIII and XIV prescribe the duties of the superintendent under this act and other acts relevant to the service, and also define his general duties, under the direction of the Secretary of the Treasury, as superintendent of the service.

Section XV relates to the use of the seal.

ORGANIZATION OF THE CONSULAR BUREAU.

For the purposes of organization, classification, and transaction of business, Section XVI further provides for the organization of the bureau of the consular service, and defines the duties of its respective branches under the following divisions:

First. The division of accounts for salaries, rents, hospital dues, and consular fees, and all other accounts not otherwise assigned.

Secondly. The division of consular appointments and property containing names and record of officers, and lists of property of the United States at the different consulates.

Thirdly. The division of seamen, charge of relief accounts, and all other matters relating to seamen presented by the act.

Fourth. The division of invoices to have charge of all instructions and other matters, except accounts for fees relating to invoices.

Fifthly. The division of judicial powers of consuls, so far as relates to the financial business incident to the provisions of this act relating thereto.

Sixthly. The division of consular archives and commercial statistics, &c.

THE SPECIAL DUTIES OF THE SUPERINTENDENT OF THE CONSULAR SERVICE DEFINED.

In order to complete the definition of the duties of the superintendent of the consular service, the bill (Sections XVII, XVIII, XIX, XX, XXI, XXII,) next requires that that officer, under the direction of the Secretary of the Treasury, shall prepare all forms of books, instruments, blanks, and papers, necessary to the business of consulates and the carrying out of the provisions of this act; defines the penalties for forgery of seal and fraudulent alteration of forms, and for not using the forms issued by the Department. It also designates the annual reports to be made by the superintendent of the consular service to the Secretary of the Treasury for transmission to Congress; respecting the home and foreign work of the service; requires the superintendent to prepare a commercial report to be submitted to Congress by the Secretary of the Treasury within thirty days after the commencement of each ordinary session; requires for the purpose of this report that consular officers make returns to the Secretary of the Treasury, under cover to the superintendent of the consular service, at the time and in the manner instructed, of commercial, mercantile, and other information respecting the ports or places at which they reside; requires a record of consular

books, forms, seals, arms, flags, presses, and furniture, of all kinds, the property of the United States at each consulate; explains the superintendence of the transfer of such property from one officer to another, and holds officers accountable for all destruction, waste, or loss of property, unless said destruction, waste, or loss is to be accounted for in a satisfactory manner.

The importance of this section is greater probably than might be imagined. At present there is an intention to assure this accountability, but, as far as I can learn, the practice of it is merely nominal. Consular officers, upon removal, leave their posts and carry with them almost everything of any possible use. There is scarcely a consulate visited by me that has not had some of the books of the office taken away by officers. At one time this was a common practice, insomuch that I do not remember finding a complete set of books from the time of the establishment of the consulate to the present. As far as the furniture is concerned, that is safe, for there is hardly a consulate of the United States, in any part of the globe, that has any furniture worth appropriating. The allowance on this score is usually as follows: a book-case and desk, without chairs on which to sit, or any other convenience for the transaction of necessary business. The rest of the furniture is the property of the consul, generally purchased from his predecessor. According to the present liberal facilities for the transaction of consular business, the consul has no chair belonging to the Government to offer a citizen to sit upon while waiting.

If the same principle of responsibility were applied in the Quartermaster's Department of the Army, it would be difficult to comprehend the situation of the property of the Government.

I can see no reason why there should not be allowed a reasonable supply of furniture other than a book-case, desk, and Patent-Office Reports. Neither is there any reason why there should not be a rigid rule of accountability exercised over such matters.

As one of the results of this state of things I was not surprised to find in Aden, (Arabia,) a consulate which seemed to have been lost to the Government; a Parsee, or fire-worshiper, in possession of flags, books, seals, arms, &c., which had been used at the consulate which had existed there some years before. I was not conscious of the existence of this office, as the Official Register contained no record of it. My astonishment, therefore, while awaiting the coaling of the steamer, was not slight when I discovered the consular arms of the United States over the entrance to one of the buildings, and within found books and other belongings of such an office. I learned that the consulate had been discontinued, and that the consul, on leaving, had turned the books, &c., over to this Parsee. I did not find that any other use had been made of this self-assumed consular rank than to make some display of dignity and show in connection with an unimportant trade in small wares. How much more property of the United States belonging to abandoned consulates might be gathered together, if its whereabouts were known, has often been a subject of speculation in my mind. Taking all these things together into consideration, the wisdom and necessity of some control over consular property, as provided by my bill, must be apparent to all.

GENERAL PROVISIONS.

The remaining provisions (Sections XXIII, XXIV, XXV, XXVI, XXVII) relate to the acceptance in evidence of certificates and documents sealed and signed in a given manner; define the application of

all moneys and fines paid out to the Treasury on account of the consular service; authorize consular and naval officers and certain officers of the customs to see that the provisions of the act are complied with, and prescribe when, and how, and under what restrictions an inspector may be appointed, how much he shall be paid, describe his powers, when and how he shall report, and fix the penalty for obstructing him in the execution of his duty.

This closes that portion of the bill defining the nature and extent of the bureau organization at home, and sufficiently states its powers and duties so as to enable the superintendent of the consular service in charge to carry out everything required of him under the provisions of the bill.

TITLE II.—ON FOREIGN ORGANIZATION.

The next question of importance, after an accountable, compact, and efficient home organization, is the creation of a subordinate and well-adapted foreign establishment. The most serious defect in the consular service has always been its *personnel*. Together with the efficient and in every way creditable officers, a set of doubtful characters have slipped in, and, as a rule, the service has not organization sufficient to find out the delinquents, or to fill their places with better material. In the first part of this report, in speaking of unsuitable persons as consuls, I have given a few instances in point, and have shown how much the service has suffered from its own officers. To overcome this objection, I have incorporated into my bill a simple classification to take the place of the present questionable method; have proposed a scale of pay upon which officers can live without the necessity of a petty system of speculation or imposition in order to keep out of debt; have made allowance for rents and clerical services which will free officers from unnecessary pecuniary burdens, and have made other provisions for the transaction of office business, and for the detection, trial, and punishment of unfaithful officers.

I think what I have to propose will prove a simple and feasible system to take the place of the present series of conflicting, illy-defined, expensive, and, in a pecuniary point of view, deceptive laws.

CHIEF FEATURES OF THE SECOND PORTION OF THE BILL.

Subordinate to the bureau of the consular service comes the organization of the consular service abroad. This subject constitutes the second chapter of the bill which I propose, and in addition to the naming of consulates and their classification, it makes ample provisions for the appointment of the necessary officers, the payment of salaries, and prescribes the general duties and powers of consular officers, and the penalties for a violation of their trust, and other unofficial conduct.

CONSULAR OFFICERS ASSIGNED TO THE TREASURY.

This important subject was long a matter of thoughtful consideration with me. In my investigations I found that many of the pecuniary irregularities might be traced to the administration of the service by a divided authority. The question which then arose in my mind was, what change could be made to unite this authority under a single head. I found that consular officers were, in every essential particular, accounting-officers. That being the case, it was easy to determine under what

control they should be placed. But I found it necessary to go further. The whole of the general administration of the service was directly in charge of the two Assistant Secretaries of State and a number of clerks. I could not learn that their duties were more than the receiving and acknowledging of dispatches and giving instructions. If I felt at liberty I might present some curious facts respecting the nature and effect of this arrangement. In the Treasury Department the accounts were heaped in with a number of others, and no strictly responsible officer had the control of these. The proposition as to which of the two Departments the duties of the consul most largely tend was soon settled in my mind. With the necessary bureau organization, and the transaction of the business by experienced accountants, I feel confident of greater accountability and economy. For these reasons, in Section XXXIII, I make consular officers, in the matters stated, officers of the Treasury.

ORGANIZATION OF THE PERSONNEL.

The next defect to be considered was a simple organization of the consular establishment of the Government to take the place of the present complex and ill-defined system. Under the present laws we find agents and consuls-general, vice-consuls-general, deputy consuls-general, consuls, vice-consuls, deputy consuls, consular agents, commercial agents, vice-commercial agents, consular clerks, and office clerks. Here we find ten varieties of consular officers, and two varieties of clerks. The first will be understood to mean a *quasi*-diplomatic officer. Of the rest, I have found in the cases of deputy and vice a distinction without a difference, and commercial agents are a class of officers known only to our consular service. These being a sort of supernumerary class, their creation at first, and appointment since, have been, as I can see, of no advantage to the service. The class of officers which should be abolished as unnecessary or disadvantageous to the service, are deputies consuls-general, deputy consuls, commercial agents, and vice-commercial agents. In the consular service proper there should be allowed the following grades of officers: Consuls-general, vice-consuls-general, consuls, vice-consuls, and consular agents.

In regard to clerks I will speak hereafter.

Next to this division of consular offices, I find an equally curious system of pay—a system which has been found admirably suited to a variety of constructions, all of which, as may be supposed, are not to the advantage of the Government. Of the salaried consuls and commercial agents there are two classes of each, known as schedules B and C. Schedule B, it is proposed, shall mean officers not permitted to trade, and the other to mean officers permitted to trade. Of each of these classes and schedules we find the following number:

11 consulates-general.....	schedule B
119 consulates.....	schedule B
34 consulates.....	schedule C
4 commercial agents	schedule B
9 commercial agents	schedule C

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The annual salaries of these officers range from \$7,500 down to \$500, and the total amount allowed by law to \$346,500 a year. The average pay per officer is \$2,000 a year. Out of the whole number, ninety-four consuls, or over one-half, receive \$1,500 or less a year. I have men-

tioned too often, in my former report, the incongruities of consular pay to repeat them here. It would seem, in a time of unbounded liberality, a newly created consulate would receive an amount of salary all out of proportion when compared with older and largely more important ones. In France, Havre, the least important of five consulates, including the consulate-general, over twice as much salary as at Marseilles, Lyons, or Bordeaux is paid, while the fees at Havre are less than \$3,500 a year, against \$2,300 at the other places; and the fees of the consulate-general for the past fiscal year have been nearly twenty times greater than Havre. I might mention numerous instances of this nature to prove that the present system of pay is not only unjust, but is no ratio to the importance of the office. This question, reduced to a single proposition, might be stated as follows: that, as a rule, the consulates of the United States receiving the most pay have the least responsibility. As I have frequently stated in my communications respecting the service, if a consulate is worth paying for at all, it is worth paying for sufficiently to enable its officer to live. The system of paying consuls salaries, and allowing them to trade besides, is demoralizing to the service. There are many advantages to be gained by a merchant in having in his establishment a consulate of the United States. It brings him increased trade, and gives him facilities which it would be well enough he did not possess in that way. If a consular office of this kind be necessary, it should be established in the shape of a vice-consulate or consular agency, subordinate to a full and principal officer, to keep the Government advised of the condition of the work.

PROPOSED CLASSIFICATION OF CONSULAR OFFICERS.

In order to classify consulates with a view to the salary of their officers, I have considered three principal points: first, the extent of pecuniary responsibility in fees; secondly, the extent of responsibility in transactions relating to ships and seamen; and thirdly, the extent of their importance in a political aspect. From the present list I have culled the useless offices. By "useless" I mean consulates which have had their day, but which have lost their importance during the mutations of trade and the springing up of new interests elsewhere.

The organization which I propose for the *personnel* of the consular service of the United States may be summed up as follows, (Sections XXXVI and XXXVII:)

CONSULS-GENERAL.

1. Liverpool, England.....	\$7,500
2. Paris, France.....	7,500
3. Vienna, Austria.....	6,000
4. Rio de Janeiro, Brazil.....	6,000
5. Calcutta, British India.....	6,000
6. Montreal, British America.....	6,000
7. Shanghai, China.....	6,000
8. Cairo, Egypt.....	6,600
9. Berlin, Germany.....	6,000
10. Kanagawa, (Yokohama,) Japan.....	6,000
11. Panama, United States of Colombia.....	6,000
12. Havana, West Indies.....	6,000
	75,000

VICE-CONSULATES-GENERAL.

1. Shanghai, China.....	\$3,000
2. Kanagawa, (Yokohama,) Japan.....	3,000
	6,000

CONSULATES OF THE FIRST CLASS.

1. London, England.....	\$4,000
2. Manchester, England.....	4,000
3. Melbourne, Australia.....	4,000
4. Sheffield, England.....	4,000
	16,000

CONSULATES OF THE SECOND CLASS.

1. Belfast, Ireland.....	\$3,000
2. Birmingham, England.....	3,000
3. Bradford, England.....	3,000
4. Glasgow, Scotland.....	3,000
5. Hong-Kong, China, (British).....	3,000
6. Singapore, Farther India, (British).....	3,000
7. Tunstall, England.....	3,000
8. St. Petersburg, Russia.....	3,000
9. Hamburg, Germany.....	3,000
10. Havre, France.....	3,000
11. Lyons, France.....	3,000
12. Honolulu, Hawaiian Islands.....	3,000
13. Callao, Peru.....	3,000
14. Amoy, China.....	3,000
15. Canton, China.....	3,000
16. Chin-kiang, China.....	3,000
17. Han-kow, China.....	3,000
18. Foo-chow, China.....	3,000
19. Swatow, China.....	3,000
20. Tien-tsin, China.....	3,000
21. Nagasaki, Japan.....	3,000
22. Osaka and Hiogo, Japan.....	3,000
23. Bangkok, Siam.....	3,000
24. Tangiers, Barbary States.....	3,000
25. Tripoli, Barbary States.....	3,000
26. Tunis, Barbary States.....	3,000
	78,000

CONSULATES OF THE THIRD CLASS.

1. Bombay, India, (British).....	\$2,500
2. Cardiff, Wales.....	2,500
3. Coaticook, Dominion of Canada, (British).....	2,500
4. Dundee, Scotland.....	2,500
5. Fort Erie, Dominion of Canada, (British).....	2,500
6. Hamilton, Dominion of Canada, (British).....	2,500
7. Huddersfield, England.....	2,500
8. Leith and Edinburgh, Scotland.....	2,500
9. St. John, New Brunswick, (British).....	2,500
10. Toronto, Dominion of Canada.....	2,500
11. Aix-la-Chapelle, Germany.....	2,500
12. Crefeld, Germany.....	2,500
13. Bremen, Germany.....	2,500
14. Carlsruhe, Germany.....	2,500
15. Chemnitz, Germany.....	2,500
16. Dresden, Germany.....	2,500
17. Frankfort-on-the-Main, Germany.....	2,500
18. Leipzig, Germany.....	2,500
19. Nuremburg, Germany.....	2,500
20. Sonneburg, Germany.....	2,500
21. Bordeaux, France.....	2,500
22. Marseilles, France.....	2,500
23. Matanzas, Spanish.....	2,500
24. Batavia, Java, (Netherlands Indies).....	2,500
25. Antwerp, Belgium.....	2,500
26. Brussels, Belgium.....	2,500
27. Basle, Switzerland.....	2,500

28. Zurich, Switzerland.....	\$2,500
29. Constantinople, Turkey.....	2,500
30. Buenos Ayres, Argentine Republic.....	2,500
31. Valparaiso, Chili.....	2,500
	77,500

CONSULATES OF THE FOURTH CLASS.

1. Bay of Islands, (British).....	\$2,000
2. Cape Town, Africa, (British).....	2,000
3. Ceylon, India, (British).....	2,000
4. Charlottetown, Prince Edward Island, (British).....	2,000
5. Clifton, Dominion of Canada, (British).....	2,000
6. Cork and Queenstown, Ireland.....	2,000
7. Demerara, Guiana, (British).....	2,000
8. Dublin, Ireland.....	2,000
9. Gibraltar, Spain, (British).....	2,000
10. Goderich, Dominion of Canada, (British).....	2,000
11. Halifax, Nova Scotia, (British).....	2,000
12. Kingston, Jamaica, (British).....	2,000
13. Kingston, Dominion of Canada, (British).....	2,000
14. Malta, Mediterranean, (British).....	2,000
15. Nassau, Bahama Islands, (British).....	2,000
16. Newcastle-on-Tyne, England.....	2,000
17. Picton, Dominion of Canada, (British).....	2,000
18. Port Louis, Mauritius, (British).....	2,000
19. Port Sarnia, Dominion of Canada, (British).....	2,000
20. Saint Helena, Atlantic, (British).....	2,000
21. Saint John's, Quebec, (British).....	2,000
22. Seychelles, Indian Ocean, (British).....	2,000
23. Sydney, Australia, (British).....	2,000
24. Turk's Island, West Indies.....	2,000
25. Victoria, (British).....	2,000
26. Windsor, (British).....	2,000
27. Winnipeg, British North America.....	2,000
28. Mayence, Germany.....	2,000
29. Munich, Germany.....	2,000
30. Stettin, Germany.....	2,000
31. Stuttgart, Germany.....	2,000
32. Odessa, Russia.....	2,000
33. Algiers, Africa, (French).....	2,000
34. Calais, France.....	2,000
35. Cognac, France.....	2,000
36. Nice, France.....	2,000
37. Florence, Italy.....	2,000
38. Genoa, Italy.....	2,000
39. Leghorn, Italy.....	2,000
40. Messina, Italy.....	2,000
41. Naples, Italy.....	2,000
42. Palermo, Italy.....	2,000
43. Rome, Italy.....	2,000
44. Barcelona, Spain.....	2,000
45. Cadiz, Spain.....	2,000
46. Malaga, Spain.....	2,000
47. San Juan, Porto Rico, (Spanish).....	2,000
48. Santiago de Cuba, Cuba, (Spanish).....	2,000
49. Trinidad de Cuba, Cuba, (Spanish).....	2,000
50. Amsterdam, Holland.....	2,000
51. Curaçoa, West Indies, (the Netherlands).....	2,000
52. Rotterdam, Holland.....	2,000
53. Prague, Austria.....	2,000
54. Trieste, Austria.....	2,000
55. Copenhagen, Denmark.....	2,000
56. Saint Thomas, West Indies, (Danish).....	2,000
57. Geneva, Switzerland.....	2,000
58. Stockholm, Sweden.....	2,000
59. Jerusalem, Turkey.....	2,000
60. Smyrna, Turkey.....	2,000
1. Piræus, Greece.....	2,000

62. Fayal, Portugal.....	\$2,000
63. Lisbon, Portugal.....	2,000
64. Acapulco, Mexico.....	2,000
65. Guayamas, Mexico.....	2,000
66. Matamoras, Mexico.....	2,000
67. Mazatlan, Mexico.....	2,000
68. Vera Cruz, Mexico.....	2,000
69. Aspinwall, United States of Colombia.....	2,000
70. Bahia, Brazil.....	2,000
71. Para, Brazil.....	2,000
72. Pernambuco, Brazil.....	2,000
73. Cape Haytien, Hayti.....	2,000
74. Laguayra, Venezuela.....	2,000
75. Montevideo, Uruguay.....	2,000
76. San Domingo, West Indies.....	2,000
77. San Juan del Norte and San Juan del Sur, Nicaragua.....	2,000
78. Talcahuano, Chili.....	2,000
79. Zanzibar, Africa.....	2,000
80. Apia, Friendly and Navigator's Islands.....	2,000
81. Lanthala, Feejee Islands.....	2,000
82. Tamatav, Madagascar.....	2,000
83. Tahiti, Society Islands.....	2,000
	166,000

RECAPITULATION OF COST OF PROPOSED SALARIES.

12 consuls-general.....	\$75,000
2 vice-consuls-general, (salaried).....	6,000
4 consuls, Class I.....	16,000
26 consuls, Class II.....	78,000
31 consuls, Class III.....	77,500
83 consuls, Class IV.....	166,000
	418,500

COMPARISON OF APPARENT COST OF PRESENT AND PROPOSED SERVICES.

Apparently, we have the following results in a comparison of the costs of the present and the proposed salaries :

Amount of salaries of proposed service.....	\$418,500
Amount of salaries of existing service.....	346,500
In favor of present service.....	72,000

By this classification of the offices, a number not essential to the efficiency of the service, and certainly not necessary to its economy, are proposed for abolition as follows :

CONSULATES-GENERAL.

1. Alexandria, transferred to Cairo, Egypt.....	\$3,500
2. Beirut, Turkish dominions.....	2,000
3. Tampico, Mexico.....	1,500

CONSULATES.

Schedule B.

4. Barmen, transferred to Crefeld, Germany.....	1,500
5. Bologna, transferred to Calais, France.....	1,500
6. Brindisi, Italy.....	1,500
7. Elsinore, Denmark.....	1,500
8. Funchal, Madeira Islands, (Portuguese).....	1,500

9. Hakodadi, Japan	\$2,500
10. La Rochelle, France	1,500
11. Leeds, transferred to Huddersfield, England	2,000
12. Nantes, France	1,500
13. Oporto, Spain	1,500
14. Port Mahon, Minorca, (Spanish)	1,500
15. Port Said, Egypt	2,000
16. Prescott, Dominion of Canada	1,500
17. Quebec, Dominion of Canada	1,500
18. San Juan del Sur, Nicaragua	2,000
19. Southampton, England	2,000
20. Spezia, Italy	1,500
21. Santa Cruz, West Indies, (Danish)	1,500
22. Valencia, Spain	1,500
23. Windsor, Nova Scotia, (British)	1,000

Schedule C.

24. Aux Cayes, Hayti	500
25. Canea, Crete, (Turkish)	1,000
26. Carthagena, Venezuela	500
27. Cobija, Bolivia	500
28. Cyprus, Turkey	1,000
29. Guayaquil, Ecuador	750
30. Maranhão, Brazil	1,000
31. Mexico, Mexico	1,000
32. Omoa, Honduras	1,000
33. Payta, Peru	500
34. Paso del Norte, Mexico	500
35. Rio Grande, Brazil	1,000
36. Saint Catharine, Brazil	1,500
37. Tobasco, Mexico	500
38. Santiago, Cape de Verde	750
39. Tumbez, Peru	500
40. Venice, Italy	750

COMMERCIAL AGENCIES.

Schedule B.

41. Auckland, (British)	1,000
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Schedule C.

42. Amoor River, Russia	1,000
43. Gaboon, Africa	1,000
44. Saint Paul de Loando	1,000
45. Sabanilla, United States of Colombia	500

57,250

The following is a list of consulates transferred :

CONSULATES-GENERAL.

1. Alexandria, \$3,500, to Cairo, Egypt	\$6,000
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CONSULATES.

Schedule B.

2. Barmen, \$1,500, to Crefeld, Germany	2,500
3. Bologna, 1,500, to Calais, France	2,000
4. Leeds, 2,000, to Huddersfield	2,500
8,500	13,000

CONSULATES CREATED.

The following is a list of new consulates, not including changes of classification, or pay of consulates already receiving salaries, proposed to be created into salaried offices:

1. Berlin, Germany, consulate-general.....	\$6,000
2. Bombay, India, (British,) consulate.....	2,500
3. Bradford, England, consulate.....	3,000
4. Brussels, Belgium, consulate.....	2,500
5. Cairo, Egypt, consulate-general.....	6,000
6. Calais, France, consulate.....	2,000
7. Cardiff, Wales, consulate.....	2,500
8. Carlsruhe, Germany, consulate.....	2,500
9. Cognac, France, consulate.....	2,000
10. Copenhagen, Denmark, consulate.....	2,000
11. Crefeld, Germany, consulate.....	2,500
12. Curaçoa, West Indies, (Dutch,) consulate.....	2,000
13. Dresden, Germany, consulate.....	2,500
14. Dublin, Ireland, consulate.....	2,000
15. Florence, Italy, consulate.....	2,000
16. Hamilton, Dominion of Canada, consulate.....	2,500
17. Leith and Edinburgh, Scotland, consulate.....	2,500
18. Mayence, Germany, consulate.....	2,000
19. Mazatlan, Mexico, consulate.....	2,000
20. Nuremburg, Germany, consulate.....	2,500
21. Prague, Germany, consulate.....	2,000
22. Sheffield, England, consulate.....	4,000
23. Sonneberg, Germany, consulate.....	2,500
24. Saint John, New Brunswick, (British,) consulate.....	2,000
25. Sydney, Australia, (British,) consulate.....	2,000
26. Victoria, Columbia, (British,) consulate.....	2,000

At most of the consulates above created, the fees are greatly in excess of salaries, and in addition to this, considerable trade has grown up in the adjacent districts. For instance, at Bradford, England, a feed commercial agency, not only unsalaried, but not even a consulate, the fees in 1871 amounted to \$16,706. At Bombay, Cairo, Copenhagen, and Sydney, the reasons for the change are commercial and political, and have little or no reference to fees.

ON CONSULAR SALARIES.

Before entering into a comparative exhibit of the present and proposed consular system, I wish to make a few preliminary remarks respecting the present schedules and manner of compensation of consular officers of the United States.

The laws of the United States relating to the salaries of consular officers prescribe as follows:

1. Salaried consuls are restricted to the amount of their salaries.
2. Exception: Salaried consuls receiving \$1,500 a year, and from whose consulates, without the agencies, fees are paid into the Treasury to the amount of \$3,000 a year, receive \$500 a year additional, or, in the aggregate, \$2,000 a year.
3. Feed consuls are limited to \$2,500 out of the fees, if the fees reach or exceed that sum.
4. Consular agents—maximum allowance out of fees, \$1,000 a year.
5. Salaried consular officers are allowed to retain \$1,000 in the aggregate out of the fees from the agencies in their consulates.

In brief, this is the system now in practice in the payment of the salaries of consuls. I have shown that the fixed compensation amounts to \$346,500 a year, but with the \$500 a year extra to salaried consuls out of the excess above \$3,000 fees at their own consulates, and the

\$1,000 a year out of the aggregate of fees received at consular agencies, the actual cost is largely more than is really shown by the published reports. In addition to this we must also include \$2,500 a year to feed consuls out of their fees, and \$1,000 to consular agents out of fees.

By reflecting a moment, it will be readily seen that the consular service, in addition to its average inefficiency, is extravagantly expensive. This serious matter is what prompted me in previous communications and reports to speak of the consular laws in some respects as deceptive, and calculated to cover up the actual expenses of the consular service of the United States.

In a general way I will show, by statement from official sources, the practical working of the present system of consular pay.

I have found, I may say, that official statistics, especially printed, are not always rigidly correct, but for my purposes the figures which I shall use are at least an approximation, and as such will answer. The fees employed in the annexed table are those reported under the law which requires annually a statement of the aggregate of fees received in each consular district to be sent to the Department of State. These fees, returned to December 31, 1871, I find printed in the Register of the State Department, corrected to September 25, 1872. I presume the returns to be correct as far as they go, though in many instances there are no reports; but the material at hand will enable me to illustrate my point. Where there are no returns, their omission is so much taken away from the aggregate of the increased expense of the consular service over the sums reported.

The following statement gives the aggregate by countries. A detailed view of each consular district would unnecessarily increase the length of my report.

Name of country and consulate.	Salaries, consuls.	Unsal'd consuls.	Consular agencies.	Pay of consuls fixed by law.	Fees received at consulates for year ended Dec. 31, 1871.	Allowance to consuls out of fees.	Aggregate of fees received at consular agencies.	Allowance to consular agents out of fees.	Allowance to consuls out of agents' fees.	Balance of agents' fees to Government.	Total salary to consuls.
Argentine Republic.....	1	3	.....	\$2,500 00	\$4,333 59	.....	.....	.....	.....	.....	\$2,500 00
Austria.....	2	1	3	3,500 00	10,388 75	.....	\$554 83	.....	.....	.....	6,500 00
Barbary States.....	3	1	13	9,000 00	.....	.....	.....	.....	.....	.....	9,000 00
Belgium.....	1	4	1	2,500 00	10,963 79	.....	975 00	975 00	.....	.....	5,624 34
Bolivia.....	1	1	.....	500 00	.....	.....	.....	.....	.....	.....	500 00
Brazil.....	6	2	6	12,000 00	10,792 13	584 53	96 80	96 80	.....	.....	12,584 53
Chili.....	2	1	1	4,000 00	2,556 03	.....	.....	.....	.....	.....	4,000 00
China.....	8	3	4	27,520 00	19,145 48	1,325 28	706 24	706 24	.....	.....	28,825 28
United States of Colombia.....	4	6	.....	7,000 00	5,969 66	1,108 49	.....	.....	.....	.....	8,108 49
Costa Rica.....	.....	1	2	Fees.....	.....	.....	.....	.....	.....	.....	.....
Denmark and dominions.....	3	1	7	7,000 00	1,111 05	257 23	.....	.....	.....	.....	7,257 23
Ecuador.....	1	.....	1	750 00	439 50	.....	.....	.....	.....	.....	750 00
Feejee Islands.....	1	.....	.....	1,000 00	95 92	.....	.....	.....	.....	.....	1,000 00
France and dominions.....	11	4	22	26,000 00	61,425 78	1,550 00	9,503 61	5,234 46	\$2,847 65	\$144 50	30,397 65
Friendly and Navigator's Islands.....	1	.....	1	1,000 00	5,355 00	.....	.....	.....	.....	.....	1,000 00
Germany.....	10	9	15	19,000 00	80,049 99	19,485 30	12,781 78	5,851 55	3,788 95	3,141 28	42,274 45
Great Britain and dominions.....	46	25	126	100,000 00	273,966 10	28,081 15	37,979 32	24,525 56	6,921 18	6,531 15	135,902 33
Greece.....	1	1	4	1,000 00	37 70	57 70	24 00	24 00	.....	.....	1,057 70
Guatemala.....	.....	1	2	Fees.....	731 00	731 00	.....	.....	.....	.....	731 00
Hawaiian Islands.....	1	.....	1	4,000 00	4,925 15	.....	.....	.....	.....	.....	4,000 00
Hayti.....	2	1	5	1,500 00	991 24	322 20	240 45	240 45	.....	.....	1,822 20
Honduras.....	1	1	1	1,000 00	42 31	.....	.....	.....	.....	.....	1,000 00
Italy.....	9	4	14	12,750 00	14,631 59	2,685 53	426 64	426 64	.....	.....	15,435 53
Japan.....	4	.....	1	11,500 00	9,293 14	.....	.....	.....	.....	.....	11,500 00
Liberia.....	.....	1	.....	Fees.....	46 08	46 08	.....	.....	.....	.....	46 08
Madagascar.....	1	.....	.....	2,000 00	35 92	.....	.....	.....	.....	.....	2,000 00
Mexico.....	8	18	6	12,000 00	12,306 46	5,306 93	77 50	77 50	.....	.....	17,306 93
Muscat.....	1	.....	.....	1,000 00	197 60	.....	.....	.....	.....	.....	1,000 00
Netherlands and dominions.....	3	4	6	4,000 00	5,926 35	2,724 74	2,304 72	1,172 72	.....	.....	6,724 74
Nicaragua.....	2	.....	.....	4,000 00	959 38	.....	.....	.....	.....	.....	4,000 00
Pern.....	3	1	1	4,500 00	2,501 17	26 15	.....	.....	.....	.....	4,526 15
Portugal and dominions.....	6	1	33	7,000 00	1,671 46	.....	455 98	455 98	.....	.....	7,000 00
Russia.....	3	5	6	5,000 00	180 39	74 39	111 70	111 70	.....	.....	5,074 39
Salvador.....	.....	3	1	Fees.....	854 45	854 45	.....	.....	.....	.....	854 45
San Domingo.....	1	.....	2	1,500 00	315 41	.....	45 21	45 21	.....	.....	1,500 00
Siam.....	1	.....	.....	3,000 00	238 49	.....	.....	.....	.....	.....	3,000 00
Society Islands.....	1	.....	.....	1,000 00	712 60	.....	.....	.....	.....	.....	1,000 00
Spain and dominions.....	10	9	39	23,000 00	27,838 06	2,100 25	14,628 86	9,341 11	2,779 40	2,508 35	27,879 65
Sweden and Norway.....	.....	5	6	Fees.....	628 60	628 60	36 50	36 50	.....	.....	628 60
Switzerland.....	3	.....	2	5,000 00	10,221 45	500 00	5,669 75	2,000 00	2,000 00	1,669 75	7,500 00
Turkey and dominions.....	8	4	20	16,000 00	2,647 41	.....	90 86	90 86	.....	.....	16,000 00
Uruguay.....	1	1	1	1,000 00	1,411 35	52 40	.....	.....	.....	.....	1,052 40
Venezuela.....	1	3	25	1,500 00	2,352 65	1,810 43	8 36	8 36	.....	.....	3,310 43
Total.....	172	125	245	346,500 00	563,132 73	76,437 37	86,718 11	51,975 47	19,337 18	15,405 46	442,274 55

In the above table will be seen an approximation of the cost of the present consular service, including the fixed salaries of full and principal consulates, the allowance to consuls out of fees of consulates and agencies, and the amount retained by consular agents. In this statement I accept the letter of the law, as already given in an abridged form, and make my calculations thereupon.

We have the following results:

Amount of salaries paid and fees retained by consuls, and commercial and consular agents	\$494,250 02
Amount of fixed salary allowed by law	346,500 00
Total amount expended upon unsalaried consular officers and agents in fees retained by salaried officers	147,750 02
Total amount retained by consular agents or subordinate officers	51,975 47
Total amount paid to consuls in excess of fixed salaries prescribed by law ..	95,774 55

These figures in a synoptical form show the workings of the present system of paying consular officers. The law fixes salaries of certain consulates, which in the aggregate amount to \$346,500. Additional provisions are made which run this amount up to \$442,274.55, or \$95,774.55 more.

Now, let me compare the amounts allowed by the present system with that which I propose. The deception of the laws regulating the pay of consular officers I have alluded to.

Total pay of salaried and feed consuls-general and consuls	\$442,274 55
Total cost of pay of consuls-general and consuls by proposed system	418,500 00
Total amount in favor of the proposed system	23,774 55

With this should also be considered the important fact that under the present rate of pay nine-tenths of the salaried consular officers are unable to live either decently or respectably. By the proposed system the pay is adapted to the cost of living and the requirements of the consular office in a social or political point of view.

By the figures which I have used we find the following results in a comparison of the amount of fees received and salaries proposed:

Fees received and accounted for to December 31, 1871	\$563,132 73
Salaries proposed	418,500 00
Total amount of fees in excess of proposed salaries	144,632 73

It will be here seen that the Government, after paying living salaries, will still have a revenue of \$144,632.73 a year from the consular service.

ON CONSULAR SALARIES IN GENERAL.

Section XXXVIII to Section XLII relates to the terms on which salaries shall be paid; leaves of absence granted; declares salaries to be in lieu of salaries and fees formerly paid; that salaried consular officers shall not transact business, and that compensation shall be in full.

UNOFFICIAL FEES.

In addition to the present complex mode of fixed compensation, and the retention of a certain amount of the fees, there exists a class of fees known as "unofficial fees." I have found much irregularity in fees to have been caused by this corrupting exception to the requirement of consular officers to account for all fees received. In the appended bill I make the compensation in full for salary. It is possible for a consular officer to construe many fees into unofficial, and in this way may, with

apparent honesty, deprive the Government of its lawful returns for his official services. I consider that every service performed by a consular officer, in his official capacity, should be paid for, and the fee should be accounted for to the Government.

For personal services which he is called upon to perform, only on account of his office, he should not charge, as any such personal services accorded should be gratuitous, and be left to his own discretion or humanity. By law a full consular officer is not allowed to trade, neither would he be allowed to engage in any profession, not even to correspond for newspapers. The object of these restrictions, it is apparent, is to keep him constant in his duties to the Government.

For the same reason he should not be allowed to spend the time of the Government, and that includes all his time, in other matters for which he may receive an unofficial fee. As I have said, if a consular officer received a fee, it should be an official fee, and be credited to the Government. By making his salary the pay in full, the loop-hole opened for his escape in case of illegal charges would be closed up, and a speedier and more certain way to discovery and punishment would be opened.

OFFICE EXPENSES AND RENTS.

In no respect is the consular service more deficient, and in some places more humiliating, than in the matter of office expenses and rents. The allowance of 10 per centum of the salary in addition is in no way adequate to the object in view, even when applied to the few consulates sufficiently paid. This sum, therefore, estimated upon the pittance paid for salaries at a majority of the consulates, assumes rather ludicrous proportion.

Section XLIII of the proposed bill makes the additional allowance to be thus applied 20 per centum of the salary, and this is made to cover office-rent, fuel, lights, cleaning, repairs, &c., &c. As the result of a very careful personal investigation of the subject, I will state that rents in most places have advanced from 50 to 75 per cent. I suggest the increase to the figure mentioned to cover all office expenses, so that each officer may have a proportionally equal recognition. I regret to state, as my opinion, that great partiality has been shown in the allowances for these purposes. Some consuls have almost every request gratified, whereas others are scarcely treated with common humanity, and out of a small salary the officer must live and pay nearly all his office expenses. I have carefully considered the subject, and find that 20 per cent. will not more than cover the items mentioned in the section of the bill. The additional cost of this arrangement, as compared with the present, would not be material. For instance :

Ten per cent. allowance on amount of salaries to paid and feed consuls.....	\$44,227 45
Five per cent. extra, say, for office expenses.....	22,113 72
Total cost of rents and office expenses at present	<u>66,341 17</u>
Twenty per cent. on proposed salaries for rents and office expenses.....	\$83,700 09
Total amount paid at present for same	<u>66,341 17</u>
Additional cost of proposed allowance to meet increased cost of rents, &c.....	<u>17,358 83</u>

ALLOWANCE FOR CLERK-HIRE.

The employment of clerical assistance for consular officers at the more important offices has evidently been a matter of considerable difficulty. The legislation on this subject exhibits curious uncertainty and vacilla

tion. After the repeal of a bill authorizing consular clerks, and the creation in their place of a grade known as consular pupils, with duties and requirements which, if ever enforced, would require youths of supernatural powers of intellect and endurance, the latter was abolished, and a return was made to the consular clerks. Under the present law, section 2 of the consular diplomatic appropriation act, approved June 20, 1864, the appointment of not to exceed thirteen consular clerks is authorized, the said clerks to be citizens of the United States, to be over eighteen years of age, and to receive \$1,000 salary per annum.

The application of this law has been an expense, without any practical benefit to the service. From the latest official sources I find the distribution of the clerks appointed as follows:

Place and country.	Number.	Salary.	Amount of fees to Dec. 31, 1871.
Paris, France.....	3	\$3,000	\$35,309 75
Shanghai, China.....	2	2,000	9,839 85
Havana, Cuba.....	2	2,000	19,512 41
Leipsic, Germany.....	1	1,000	7,882 25
Liverpool, England.....	1	1,000	40,646 00
Alexandria, Egypt.....	1	1,000	67 97
	10	10,000*	

If we take the above table, and compare the number of clerks at each of the consulates named, we find that Alexandria, Egypt, with \$67.97 fees received during the fiscal year ended June 30, 1871, has the same clerical force allowed it as Liverpool, England, where the fees were \$41,218.43 for the same period. But this is not the only peculiarity. Paris, with a return of fees for the same year amounting to \$20,776, or say \$50,000 during a year of peace, has three consular clerks, whereas London, with \$51,240.73 fees, has no clerks at all paid by the Government. Leaving out Paris and Liverpool, and we find either London, Manchester, or Sheffield, in England, more important in the matter of fees than Havana; yet the latter city has two consular clerks and the former three none. Leaving out Paris, London, and Havana, and we find any one of the following consular offices, Belfast, Bordeaux, Bradford, Berlin, Barmen, Chemnitz, Birmingham, Glasgow, Hong-Kong, London, Lyons, Manchester, Matanzas, Montreal, Saint John, (New Brunswick,) San Juan, (Porto Rico,) Sheffield, Tunstall, or Zurich, in receipt of fees greatly in excess of Shanghai; yet the latter has two consular clerks. In all of the above-named offices there is not a single clerk paid by the Government. One of the above consulates alone returns seven times the amount of fees received at Shanghai. There are nineteen consulates more important than Leipsic, and one hundred and sixty more lucrative than Alexandria; yet Leipsic and Alexandria have each a consular clerk, while the number of consulates above stated are entirely without clerks paid by the Government.

I mention these facts in order to show the practical working of the present arrangements for clerical assistance at consulates.

Until recently there was a consular clerk at the consulate-general at Beirut. I perceive that this appointment has been canceled, and that a new one has been assigned to Alexandria, Egypt. For the fiscal year of 1871 the fees at the former office amounted to \$109.12, and at the latter to \$67.97.

* To June 30, 1871.

I do not think it at all wise or economical to fix the number and pay of consular clerks. This branch of the service, in my opinion, should be regulated by the importance of the business of the consulate.

If consular clerks were considered prospectively consuls, it might be well to create a grade of *quasi* officers, to be assigned to the most important consular officers until promoted to vacancies in the lowest grade of consuls; but as there is no prospect, at least immediate, of so radical an improvement in the tenure of appointment and term of office, by commissioning officers during good behavior, I do not see that there is any advantage to be gained from the payment of \$1,000 a year, which is about half what an American can live on decently in a foreign land, to a consular clerk, who must be a citizen of the United States.

The plan which I bring out in the appended bill is capable of expansion or contraction, according to the requirements of the service.

In this branch of the service, I think, it would be more economical and fully as advantageous to the service to permit the employment of natives at the ruling rates of salary paid in first-class mercantile houses at the place for the same character of work. On this plan, two or three equally efficient clerks could be secured for the present allowance for a single clerk. It would certainly be desirable to employ American citizens, provided they were sufficiently well paid. In the absence of suitable provisions in this respect, I consider the next best course that proposed.

The plan, therefore, which I suggest is an allowance of 15 per cent. of the fees in excess of \$4,000 received at any consulate, exclusive of the fees from agencies, in any one year, to be used for clerk hire, but in no case should the said allowance be less than \$250, nor more than \$3,500 at any one consulate in any one year. This would allow Paris, London, Liverpool, and Manchester the maximum amount, and thirty-three other consulates of less receipts of fees smaller amounts in proportion to the amount of business, down to the minimum allowance of \$250. In order to prevent any abuse of this allowance, the bill requires the consular officer to make application through the proper channels for authority to appoint clerks. Before any amounts are paid, the appointment for the time being must be sanctioned by the Secretary of the Treasury.

I consider that a consul can personally attend to the business involved in \$4,000 a year of fees. This amount in full, however, would require close attention to duty. As I have stated, I suggest the allowance of a minimum of \$250 a year, which would be 15 per cent. on an excess of \$16.70 a year, and as the business increases above that sum, the force could be increased as the necessities of the service would require until the maximum of allowance, \$3,500, be reached. Under this plan, the following consulates would be entitled to an allowance for clerk hire, and to the sums for the year below stated:

List of consulates or consular agencies of the United States returning fees for the year ended December 31, 1871, in excess of \$4,000.

Name of place.	Total fees.	Excess.	Allowance.
1. Berlin.....	\$8,872 00	\$4,872 00	\$730 80
2. Bordeaux.....	6,645 64	2,645 64	396 84
3. Brussels.....	6,425 00	2,425 00	363 75
4. Buenos Ayres.....	4,333 59	333 59	250 00
5. Calcutta.....	4,104 25	104 25	250 00
6. Chemnitz.....	10,137 50	6,137 50	920 62
7. Clifton.....	4,161 50	161 50	250 00
8. Coaticook.....	6,122 00	2,122 00	318 30
9. Crefeld.....	4,075 00	75 00	250 00
10. Dresden.....	6,522 00	2,522 00	378 30
11. Dundee.....	7,052 89	3,052 89	457 93

List of consulates or consular agencies returning fees, &c.—Continued.

Name of place.	Total fees.	Excess.	Allowance.
12. Glasgow.....	\$12,410 75	\$8,410 75	\$1,261 51
13. Hamburg.....	8,028 29	4,028 29	604 24
14. Hamilton.....	4,790 50	790 50	250 00
15. Havre.....	4,162 12	162 12	250 00
16. Hong-Kong.....	6,172 82	2,172 82	325 92
17. Honolulu.....	4,925 15	925 15	250 00
18. Huddersfield.....	4,297 50	297 50	250 00
19. Kanagawa.....	6,128 38	2,128 38	319 45
20. Leipsic.....	7,882 25	3,882 25	582 23
21. Leith.....	4,077 31	77 31	250 00
22. Liverpool.....	40,646 00	36,646 00	3,500 00
23. London.....	56,850 56	52,850 56	3,500 00
24. Lyons.....	8,446 50	4,446 50	666 97
25. Manchester.....	31,484 50	27,484 50	3,500 00
26. Montreal.....	6,614 07	2,614 07	392 11
27. Nottingham.....	5,554 75	1,554 75	250 00
28. Paris.....	35,309 75	31,309 75	3,500 00
29. Rio de Janeiro.....	5,031 73	1,031 73	250 00
30. Shanghai.....	9,839 85	5,839 85	875 97
31. Sheffield.....	9,252 75	5,252 75	787 91
32. St. John, (New Brunswick).....	6,477 58	2,477 88	371 68
33. St. John's, (Quebec).....	4,008 00	8 00	250 00
34. Toronto.....	4,788 50	788 50	250 00
35. Tunstall.....	8,912 58	4,912 58	736 88
36. Vienna.....	6,556 25	2,556 25	384 43
37. Zurich.....	4,979 70	979 50	250 00
Total.....			28,375 00

Minimum rate \$250 a year for all excesses of fees up to \$1,670. Maximum rate \$3,500 a year from \$23,333.50 and upward.

As will be perceived by the above statement, the cost of, say, eighty-one clerks at thirty-seven consulates, with fees ranging from \$4,000 to \$56,000, is but \$28,375 under the proposed system, against ten clerks at six consulates, at a cost of \$10,000 under the present. By the proposed system the average rate of compensation per clerk would be about \$350 a year instead of an average of \$1,000 a year. Thus, for three times the present expenditure, the Government secures eight times the number of clerks.

The bill further provides for the discontinuance of allowances when the fees fall below the minimum.

The following table gives a comparative view of the consular service of the United States with several of the European nations, as represented at five foreign ports:

Place and country.	Rank.	Staff.	Salaries.	Allowances.
Hamburg:				
United States of America..	Consul.....	Vice-consul.....	\$2,000 00	\$200, rent.
Great Britain.....	do.....	do.....	3,872 00	\$1,616.56, rent and office expenses.
France.....	Consul-general..	Chancellor and two clerks.	7,937 60	Actual expenses.
Brazil.....	do.....		2,178 00	\$290 and fees.
Havre:				
United States of America..	Consul.....	Vice-consul.....	6,000 00	\$600, rent.
Great Britain.....	do.....	Vice-consul and cl'k.	4,128 68	\$1,452.
Honolulu:				
United States of America..	do.....	Vice-consul.....	4,000 00	\$400, rent.
Great Britain.....	Consul-general..		5,324 00	\$1,936.
Paris:				
United States of America..	do.....	Vice-consul-general and three clerks.	8,000 00	\$1,200, about.
Great Britain.....	Consul.....		484 00	\$968.
Italy.....	Consul-general..	Vice-consul.....	5,517 66	Certain part of fees.
Rio de Janeiro:				
United States of America..	Consul.....	do.....	6,000 00	\$600, rent.
France.....	do.....		6,060 00	\$1,539.12, rent and other expenses.
Italy.....	do.....	Vice-consul.....	6,853 44	\$2,323.20.
Great Britain.....	do.....		4,840 00	\$3,872.

The same proportion exists very generally in European and South American countries. In Asiatic countries the United States consular officers do not compare so advantageously with respect to salaries, and are emphatically worse off as regards allowances. My communications from Japan and China alluded to the dire extremities of our consular officers at times from insufficiency of allowances for rent and office expenses, and the consequent drain upon their salaries.

FEED CONSULS.

The appended bill also contemplates the abolition of that class of consuls paid out of the fees, and for two reasons. The first is, that at a place where the business is important, there should be a full and principal officer; and where it is not, there should be an officer subordinate to some principal. Where the fees are important, the consuls are usually citizens of the United States; but where they are inadequate to support an officer sent out, the consuls are subjects of a foreign state, independent of the supervision of an American officer in the country, and at liberty to use their office as they may see fit.

By referring to the official register of consular officers, it will be seen that consulates have been established at places where there is not the slightest apparent reason for their presence. I regret to feel compelled to state that these officers, though personally highly creditable to their own nationality, are not always equally so with respect to their assumed official character. I will mention one instance to suffice for all. At a certain city in Europe there resided a merchant of wealth who found difficulty in gratifying his aspirations for more consideration than was paid him in his private capacity. Through the assistance of an American official he secured the appointment of American consul at his city. There were no American interests there, but the object of the merchant was accomplished. He was no longer simply *monsieur*, but *monsieur le consul Américain*. He could wear the American arms over his office, and emblazon the national escutcheon on the panels of his coach.

Taking everything into consideration, it will be admitted this is cheap notoriety. I regret to state that the cheapest part of the whole transaction was certainly the commission which he could so easily secure.

I may add that I was informed that the official subsequently received periodical and acceptable donations of wines from the bounty of the grateful recipient of consular honors.

Again, this grade of officer is abused by the appointment of naturalized citizens of the United States as consuls to the countries from which they emigrated. As is well known, many have sought refuge on our shores who, in the cause of freedom at the places of their birth, have found a land of adoption more agreeable than the land of their nativity. It is not necessary for me to single out instances of this nature; I merely wish to call attention to the fact that consulates have been created for this class of persons, and the greater portion of their duty seems to have been a degree of disgusting arrogance, offensive to the government tolerating their official presence, and not creditable to the government which sent them.

In order that I may not be misunderstood, I will add that some of the most distinguished consuls in our service are citizens by adoption. My remarks refer not to these, but to those not in the class of paid, and hence full and principal consuls.

I might adduce other instances of the same nature. I merely state these that it may be understood why, in my opinion, all consular officers should be salaried, and those receiving fees should be subordinates.

TEMPORARY CONSULS.

Under the present consular system I find a class of officers termed commercial agents. These are only known to the consular service of the United States. I look upon this grade or class of officers as a sort of unnecessary appendage, and which could well be dispensed with. Indeed I look upon it as a positive disadvantage to the service. Section XLV of the annexed bill provides for the appointment of temporary consuls at places where there is a demand for consular officers, and regulates how the same shall be disposed of when there is no longer any need of their services. This arrangement will bring all consular officers under one general classification.

One great need of the present service is a convenient method of establishing new consulates when necessary, and of abolition when there exist no longer any sufficient reasons for the continuance of those already created.

APPOINTMENTS, EXAMINATIONS, AND PROMOTIONS.

One of the leading causes of the questionable average standard of the consular service of the United States, I have found to be the general lack of ordinary scholarly attainments among its officers. To prevent such persons from securing appointments in the future, the bill provides not only for the examination of candidates, but makes this examination a necessary antecedent to an appointment into the service, prescribes how these examinations shall be conducted, designates the age and qualifications of candidates, defines how promotions shall be made, designates the course to be pursued in the commencement of the act, in order to secure a fair distribution of consular officers among the States of the Union, &c.

By the plan of promotions proposed the service will always have in it a certain proportion of experienced officers. This system I consider next best to a permanent service with the tenure of office during good behavior. (See Sections XLVI, XLVII, XLVIII, XLIX, and L.)

EXPENSE OF REMOVALS.

In addition to the disadvantages of the existing mode of appointment to the consular office by filling it frequently with unsuitable persons, I have found that frequent removals greatly increase the expense of the service. Officers, though not allowed transportation or living *en route* to their posts of duty, receive thirty days' salary while receiving instructions and salary in transit; meanwhile the consul in office receives pay until his successor arrives and takes possession. These frequent removals and appointments have, ever since the payment of salaries to consular officers, been a source of unnecessary expense to the Government. This amount, if added to the present rate of pay, would almost be sufficient to meet the extra outlay necessary to suitable pay and allowances. I will take the fiscal years of 1870 and 1871 in order to illustrate this statement. This amount, proportionately, is a fair average, and, in my opinion, matters will grow worse if provision be not made to relieve the Government from the importunities of persons desirous of appointments in the consular service, making merit, and not politics, the gauge of preferment.

Approximation of annual cost of removals and new appointments to the consular service of the United States, 1870.

Cost of fixed salaries	\$346,500 00
Cost of full salaries (\$2,500) feed to consuls	21,000 00
Cost of ten consular clerks	10,000 00
Cost of marshals, &c	10,000 00
Total	<u>387,500 00</u>
Total amount allowed for salaries during the fiscal year ended June 30, 1870	\$451,030 38
Total amount expended as above	<u>387,500 00</u>
Approximate cost of removals for 1870	<u>63,530 38</u>

Taking the same estimate for 1872, (salaries \$475,861.95,) I find the cost \$88,361.95. I think it would not be too much to estimate the yearly loss hitherto sustained from this cause at \$50,000, and this in addition to the demoralizing tendency of these frequent changes.

CONSULAR SUPERVISORY JURISDICTIONS.

In order to have a responsible superior officer in the country, the following bill contemplates the creation of defined supervisory jurisdictions under the direction of consuls-general. These officers will stand between the Government at home and the consuls abroad.

They are also made the channels of communication with the home Bureau.

By thus having all accounts and communications pass under the inspection of a superior officer, the Government will find itself constantly in possession of trustworthy and authenticated intelligence of the working of the service. It will also be observed by reference to the bill that these supervisory officers have no authority to interfere in the business of consulates other than their own. Their privilege is merely the right to receive and inspect accounts and reports sent to them, and their duty to address the Secretary of the Treasury respecting their views relative to such accounts and reports, and upon the character of the service and its officers within their respective jurisdictions, and for which they will be held responsible. Many of the discreditable acts of consuls have long gone without notice for want of some intermediate officer to execute promptly the orders of the Government. (Sections LXII, LXIII, and LXIV.)

CONSULAR FEES.

My communications relative to the condition of the accounts of consular officers must have suggested to you the negligence which has characterized the service in this respect. At every consulate I found, since its establishment, more or less disorder in the accounts of fees. At some places I found wide gaps which I took to be evidence that the consul kept no account at all, and in all probability appropriated the fees. Occasionally these important accounts were kept in lead pencil. I do not believe at all the consulates examined by me I found a half dozen, indeed I might say a single complete set of fee-books or fee-accounts, beginning at 1856. The causes which might lead to such an extraordinary state of affairs may easily be imagined. Besides fees accounted for, I heard complaints of overcharge of fees, past and present. Nor did I find a half dozen consular offices in which a table of consular fees was posted in a convenient place for the benefit of persons

having business with the consulate. On this subject I have been careful to embrace in the following bill provisions to meet all the requirements of this branch of the consular business, at least so far as I have been able to judge them. (Sections LXVI, LXVII, LXVIII, LXIX, LXX, LXXI, LXXII, and LXXIII.)

REMAINING FEATURES OF CHAPTER THE SECOND.

The remaining sections of this portion (chapter the second) of the appended bill, relate to the compensation of unclassified consular officers, &c., to the general powers, duties, responsibilities, and accountability of officers, settlement of consular jurisdictions, incidental duties of officers with respect to documents and ships, the enforcement of the laws of the United States, especially in the use of the American flag to cover illicit trade in certain countries, the custody, conveyance home, and punishment of offenders, and for the punishment of consular officers guilty of unofficial conduct. (Section LI to LXI and LXV and LXXV to CI.)

HOSPITAL DUES.

I should perhaps make a particular statement with regard to the subject of hospital dues. By act of Congress a certain amount monthly is deducted from the pay of each seaman, a citizen of the United States, for the benefit of the fund for the relief of sick and disabled American seamen, (act approved June 29, 1870.) These dues, however, are payable in the United States upon the return of the vessel to the United States. The framer of the bill was probably not aware that American ships frequently remain abroad for some years. It so happens, as a rule, that the papers of these ships are lost, or for some other reason they are not produced when wanted, and the Government falls short of its legal dues, except, perhaps, on the last crew, which amount could not very easily be evaded.

In my communications at different times, I have explained this by giving cases in which the same has occurred. I will mention but one instance here. The ship *Leucothea* was sold at Amsterdam, in June, 1872. When called upon for shipping-articles and other necessary papers, could only produce from March 12, 1871. Twenty-one sailors, at 40 cents a month, made \$126; this the consul collected, and, approximating the balance for five or six years, the time which had elapsed since the ship's departure from the United States, collected the whole. This was the case of a vessel sold abroad. In all other instances, the collections are made in the United States. On the west coast of South America, I learned of vessels which had been engaged in trade between foreign ports for fifteen years without returning to the United States. The appended bill corrects this by an amendment to the section of the act authorizing the collection of these dues. (See Section LXXIX of the appended bill.)

I have no doubt the Government loses large sums in this manner. Under the proposed system, it will be seen that collections will be made yearly by collectors or consuls wherever the vessel may first arrive after the 1st day of January of each year.

THE PROTECTION AND RELIEF OF AMERICAN SEAMEN ABROAD.

The third chapter of the appended bill takes up the important subject of the reciprocal duties of consular officers of the United States and

masters of American ships, and the relief of destitute American seamen at foreign ports or places.

Perhaps no portion of the consular duties has been more faithlessly performed than the granting of relief to destitute American seamen, at foreign ports, out of the fund for that purpose. My communications on that subject gave ample details. For these I would refer to my report of May 22, 1872, page 142 to 157, especially concerning the relief accounts on the west coast of South America.

It is not necessary to repeat these facts here. In the beginning of this report I have given a synopsis of information under this head sufficient to answer my present purposes. I am convinced that this same conduct, to a greater or less degree, according to circumstances, will continue unless some change be made to insure more thorough accountability. It is true the amounts expended are less now than ever before. In 1860 they were over three times as much. Notwithstanding this, the Government is still taxed over \$30,000 during the fiscal year of 1871 to make up the excess of disbursements over receipts. The Government would certainly not desire to have a revenue from this source, but there is no reason why the receipts and disbursements should not be nearer equal. I have not the least doubt, if the laws were rigidly enforced, and honestly and economically, that is judiciously administered, that there would be a smaller annual deficit to be made up. When it is borne in mind, however, that in 1860 the excess of disbursements over receipts was \$175,062.34, and in 1871 \$31,583.02, it must be admitted that there has been considerable improvement since. I do not consider the collection of extra wages, even if the Government and seamen in every case received the full benefit, as an equitable plan of meeting the necessities of the relief measures provided by law. I am of the opinion that it is an unjust tax upon American shipping. It is the cause, directly or indirectly, of a majority of the difficulties between the master and seamen, and it is most certainly a fruitful source of speculation for dishonest consular officers.

The difficulty of reaching seamen in order to verify accounts, renders it practically impossible to ascertain their regularity or irregularity. I experienced this inconvenience during my own investigations. I was frequently astonished at the evidence of the utmost temerity of consular officers in their transactions connected with the relief fund. It is not necessary for me to repeat what I have already narrated in my communications and reports, as to the means resorted to to this end. I also feel convinced that out of the sums accounted for, considerable amounts have been obtained through fraudulent vouchers. It would be almost impossible to learn the truth, yet I am of the opinion that not insignificant sums are collected and not accounted for at all. For instance, the three months' extra wages, fifty to sixty dollars, and the seaman's wages are collected, and relief given in a meager way, or not at all, or at the expense of the Government. The seaman is then shipped. The Government's one month's extra wages and the seaman's two months' extra wages, and hard-earned wages, are wholly or mostly consumed in collusion with the boarding and shipping masters. These are the transactions of which the Government knows nothing, and has no means of learning. Perhaps a small account of relief is submitted for appearances. Where there is little or no shipping, and hence no extra wages, they resort to the practice of returning large relief bills, which they collect by means of fraudulent vouchers. This I believe to have been a common practice on the west coast of South America for the last twenty-five years.

Before stating the plan which I have to propose to remedy these evils, I wish to give from official sources the number of American ships cleared for foreign countries, and the disbursements for relief and receipts of extra wages for the same period. I may state that the year here employed is the most favorable of any since 1860, and I might say since the establishment of the present service.

Statement exhibiting the number of American vessels, with their tonnage and crews, cleared from the United States for foreign countries, and the amount of disbursements for relief, and receipts of extra wages, for the year ended June 30, 1871. (Compiled from the annual report of the Chief of the Bureau of Statistics for 1871, and from the report of the Fifth Auditor of the Treasury.)

Countries, &c.	Cleared.			Disbursements.	Receipts.	Ports.
	American vessels.					
	Number.	Tons.	Crews.			
1. England, (including Wales.)	451	482,644	8,841	\$3,224 16	\$4,354 10	Bradford, Bristol, Cardiff, Falmouth, Liverpool, London, Manchester, Newcastle-on-Tyne, Sheffield, and Southampton.
2. Scotland	4	3,215	65	5,287 00	.....	Dundee, Glasgow, and Leith.
3. Ireland	78	63,330	1,222	102 25	105 00	Cork.
4. Gibraltar	57	20,692	537	163 13	247 96	
5. British East Indies	16	15,812	318	828 15	2,730 87	Bombay, Calcutta, and Singapore.
6. Australia	25	18,047	387	505 87	374 43	Melbourne and Sydney.
7. Hong-Kong	16	15,905	375	1,611 00	661 00	
8. British possessions in Africa.	23	5,461	205	2,758 59	460 99	Cape Town, Seychelles, Sierra Leone, Mauritius.
9. Canada	4,938	1,112,633	29,212	168 38	.....	Clifton, Fort Erie, Quebec.
10. Prince Edward's Island and Newfoundland.	44	4,908	301	.....	.....	
11. New Brunswick and Nova Scotia.	862	336,571	10,475	1,542 93	.....	St. John, Halifax.
12. British Columbia...	218	93,454	3,968	293 00	86 25	Victoria.
13. British Honduras ..	17	1,870	102	.....	.....	
14. British Guiana	72	14,579	543	.....	48 36	Demerara.
15. British West Indies	473	98,194	3,968	2,673 46	316 68	Barbadoes, Kingston, Jamaica, Turk's Island, and Nassau.
16. Other British possessions.	3	1,086	29	331 80	678 83	Bermuda, Malta, St. Helena.
17. Russia on the Baltic and White Seas.	35	22,579	475	283 21	.....	Riga.
18. Russia on the Black Sea.	.....	.....	.....	.....	.....	
19. Asiatic Russia	13	1,876	118	.....	.....	
20. Sweden and Norway	3	1,491	30	19 81	.....	Stockholm.
21. Denmark	6	2,754	55	16 08	.....	Elsinore.
22. Danish West Indies.	58	16,680	575	1,430 39	.....	St. Thomas.
23. Other Danish possessions.	1	335	9	.....	.....	
24. Germany	67	52,402	974	598 44	632 03	Geestemünde, Hamburg.
25. Holland	46	29,363	607	283 12	202 22	Amsterdam, Rotterdam.
26. Dutch East Indies...	9	6,540	157	1,493 28	485 64	Batavia.
27. Dutch Guiana	11	2,369	87	133 98	.....	Paramaribo.
28. Dutch West Indies	14	1,924	111	.....	769 59	Curaçoa.
29. Belgium	61	52,581	989	8 00	74 99	Antwerp.
30. France	84	64,707	1,279	1,234 51	419 04	Boulogne, Havre, Marseilles, Nantes, Nice.
31. French possessions in Africa.	10	2,422	84	3 45	.....	Algiers.
32. French possessions in North America.	6	1,084	42	.....	.....	
33. French Guiana	9	905	58	.....	.....	
34. French West Indies	87	15,753	600	.....	.....	
35. French islands of the Pacific.	23	4,226	181	.....	.....	
36. Spain	75	28,137	732	3,686 78	618 56	Barcelona, Cadiz, Malaga, Valencia.
7. Philippine Islands...	6	10,435	198	529 86	113 00	Manila.
8. Canary Islands	6	1,814	48	.....	17 00	Teneriffe.

Statement exhibiting the number of American vessels, with their tonnage, &c.—Continued.

Countries, &c.	Cleared.			Disbursements.	Receipts.	Ports.
	American vessels.					
	Number.	Tons.	Crews.			
39. Cuba	1,343	521,636	17,065	\$679 22	\$2,124 63	Havana, Matanzas, Trinidad de Cuba.
40. Porto Rico	268	54,884	2,018	.....	.....	
41. Portugal	26	9,598	224	.....	.....	
42. Azores, Madeira, and Cape de Verde Islands.	22	4,697	196	2,718 83	689 09	Fayal, Funchal, Santiago, Cape de Verde.
43. Other Portuguese possessions.	2	354	20	.....	.....	
44. Italy	59	29,901	667	42 86	178 69	Ancona, Genoa, Leghorn, Messina, Naples.
45. Austria	13	5,576	124	107 41	178 11	Trieste.
46. Greece .....	.....	.....	.....	8 36	.....	Piræus.
47. Turkey in Europe..	6	2,820	61	112 99	.....	Constantinople.
48. Turkey in Asia	5	1,550	48	129 95	.....	Smyrna.
49. Turkey in Africa...	1	297	8	101 16	.....	Alexandria.
50. China	10	7,064	171	753 95	939 01	Amoy, Canton, Shanghai, Swatow.
51. Japan	15	51,707	1,585	86 00	136 00	Hiogo, Kanagawa.
52. Liberia	4	1,784	44	.....	.....	
53. Other ports in Africa	4	1,130	42	.....	.....	
54. Mexico	171	50,975	2,336	2,306 91	42 66	Acapulco, La Paz, Manzanilla, Minatitlan, Tabasco, Tampico, Vera Cruz.
55. Guatemala	3	725	27	.....	.....	
56. Honduras	66	4,559	376	.....	.....	
57. San Salvador	5	1,059	39	.....	.....	
58. Nicaragua	2	1,235	38	.....	.....	
59. Costa Rica .....	.....	.....	.....	.....	.....	
60. United States of Colombia.	106	170,547	4,929	1,494 80	915 00	Aspinwall, San Andrés, Panama.
61. Venezuela	6	1,242	47	.....	320 18	Puerto Cabello.
62. Brazil	160	62,064	2,110	3,345 21	862 94	Bahia, Maranhão, Para, Rio Grande del Sur, Pernambuco, Rio Janeiro, St. Catherine.
63. Uruguay	29	12,661	312	399 78	176 88	Montevideo.
64. Argentine Republic.	28	13,224	311	25 00	.....	Buenos Ayres.
65. Chili	11	9,328	194	7,313 19	1,930 83	Talcahuano, Valparaiso.
66. Bolivia .....	.....	.....	.....	.....	.....	
67. Peru	38	33,655	600	8,298 26	2,948 59	Callao, Payta, Tumbes.
68. Hayti	84	16,442	713	6 00	.....	Aux Cayes.
69. San Domingo	36	11,970	466	.....	.....	
70. Sandwich Islands ..	57	41,283	1,410	3,573 25	4,199 81	Honolulu.
71. All other countries and ports.	5	2,370	66	1,815 09	306 00	Tabiti.
				249 85	300 59	Zanzibar.
				68 80	95 00	Bangkok.
				1,082 46	34 95	Guayaquil.
				1,049 89	.....	
72. Whale fisheries	57	11,875	1,406	1,600 43	812 00	Falkland Islands, Bay of Isl'ds.
Total	10,573	3,741,945	105,605	61,429 29	30,729 58	

Without comment I desire to call your attention to the disbursements and receipts on account of relief of destitute American seamen in the several countries or portions of the globe above mentioned. A comparison indicates a marked disproportion in several cases. For instance, let me compare Peru and Chili with England :

	Vessels.	Tons.	Seamen.	Disbursed.	Received.
Peru	30	33,655	600	\$8,298 26	\$2,948 59
Chili	30	9,328	194	7,313 19	1,930 83
England and Wales	451	482,644	8,841	3,224 16	4,354 10

In the detail of this expenditure we find the following :

Peru.—Callao, \$3,864.12 disbursed; \$2,408.59 received. Payta,

\$4,229.89 disbursed; \$440 received. Tumbez, \$204.25 disbursed; \$100 received. For 1870, the year before my visit to the consulate at Tumbez, and before an officer of intemperate habits, and consequent inability to keep the accounts, had arrived, Tumbez returned \$3,646.12 disbursed, \$481 received, and the second quarter not received. This would seem to be one instance, at least, in which intemperance might be construed as an advantage. Such a sudden and astonishing difference certainly does not speak well for previous accounts.

Chili.—Talcahuano, \$5,829.72 disbursed; \$1,439 received. Valparaiso, \$1,483.57 disbursed; \$491.83 received.

England and Wales.—Liverpool, \$2,116.03 disbursed; \$3,973.55 received; and the balance, \$1,108.13 disbursed, and \$380.50 received, at Bradford, Bristol, Cardiff, Falmouth, London, Manchester, Newcastle-on-Tyne, Sheffield, and Southampton.

I would also call your attention to line number 36, Spain, in the above table. Of the amounts for that country, \$2,919.21 disbursed, and \$135 received, stand against Malaga. Line number 42, under Azores, &c.; the amount of \$2,486.06 was disbursed and \$602.09 received at Fayal. This I find to be a sudden decline. During the preceding year (1870) the amounts at the same place were \$8,353.63 disbursed and \$1,368 received. The extraordinary and disproportionate sums expended at the above places, as compared with our commerce, has frequently been a subject of considerable though idle complaint from the officers of your Department. Nor have I been backward in expressing my opinion. It is gratifying to say that there has been some improvement of late.

CAUSE OF THE IRREGULARITIES IN RELIEF ACCOUNTS.

The principal defect in the mode of transacting this branch of the consular duties is the want of a perfected system of accountability. I consider the solitary sending of an account in such a form with vouchers in such a form is the least reliable evidence the Government could have of an expenditure, if an officer were disposed to be dishonest. This, however, will be found to constitute the main stay and support of the Government in its management and control of disbursements from the relief fund. In addition to this, the laws are inexplicit, and in my opinion too much discretion is allowed, or at least assumed by consular officers. I can easily comprehend the consequences of a reliance upon the discretion of some persons who have secured places in the consular service. The imbecility of the existing plan of relief, and the unjust, unequal, and, in most cases, extortionate tax put upon American commerce to meet in whole or in part the demands upon the relief fund, was one of the first features of the service which attracted my attention. The more I investigated, the stronger were my convictions of the utter irresponsibility and expense of the system. I found that the authority given to consular officers to collect extra wages was not only an unusually harsh measure, but it did not even in a satisfactory way carry out the humane spirit and intentions of the law. It gives an officer a weapon against masters of American ships which could be, and has, I am aware, been seriously misused. It gives the seaman a field for profitable mutinous or disorderly conduct. All sorts of complaints have been made by seamen against masters, and the ships have been mulcted to the amount of the seamen's wages and extra wages, to the profit of the seamen.

There is a class of unprincipled men known as "sea-lawyers," whose

chief vocation is to excite and encourage seamen to disorder, so as to bring on a conflict with the master, and then demand a discharge and extra wages. Not inconsiderable sums have thus been extracted from the money-chest of the ship.

But it is unnecessary for me to consume more of your time with these matters. The present law was unquestionably passed in the right spirit. Its object was to protect seamen thrown upon a foreign shore helpless and destitute.

This may occur in several ways. By shipwreck, by the conduct of the master, or by voluntary or forced desertion. In order to correct these abuses, I propose, as the first measure of reform, the repeal of all existing laws authorizing the collection of extra wages and disbursements on account of relief of destitute American seamen. In their place I present a system of relief dues on the tonnage of vessels to meet the wants of a fund for the purpose. The conditions of the disbursement of this fund are also stated.

With this object in view the appended bill (Sections CII to CXXXIV included) provides for the repeal of all acts inconsistent with the present act. The superintendent of the consular service and consular officers are specially charged with the duty of carrying out all acts relating to seamen. Seamen's wages are required to be paid when an American ship is sold abroad, and further provisions are made for the proper use of a portion of these wages for the benefit of the seaman; thus putting an end to the squandering of all his money. It constantly happens that a seaman, after getting hold of his wages, indulges in a round of riot and debauchery. After a short time, robbed and beaten, he becomes destitute and falls upon the Government for relief. I am not of the opinion that the laws contemplate any such a use of seamen's wages, and I consider that it is neither just nor desirable that the Government or the ship should make up deficiencies brought about by such wanton extravagance. The section, therefore, relating to this particular subject requires that the seaman, when able, shall share in the expense of relief.

PROPOSED PLAN FOR A RELIEF FUND.

The bill next provides that relief dues to the amount of one-half of a cent per ton of registered tonnage shall be charged and collected by consular officers of the United States upon all American ships entering the ports of their respective consular districts. These dues are made to take the place of extra wages.

The advantages of the proposed plan, in my mind, are clear. We have first a record of the entry of the ship. This the Government can know from other sources independent of the consulate, that is, through the customs at home upon clearance, or from the ship's papers deposited with the collector upon her return. In the case of extra wages, there were exceptions to the portion of the law which required them to be collected. As I have shown in my communications there have undoubtedly been officers who, for a consideration, hardly from good will, have released the ship from the payment of extra wages, noting desertion or some other plausible reason for their abatement, on the agreement and ship's papers. Ultimately, notwithstanding this, the Government is charged with the relief of these same seamen. By the plan proposed there is no opportunity for such irregularity, for every vessel, without exception, is required to pay these dues, and, if not collected or accounted for, the amount is required to be deducted from the consular officer's pay, and the officer himself dismissed the service.

In addition to this means of becoming cognizant of the conduct of consular officers, independent of any action he might wish to take in order to cover his conduct, the Government has also the consul's returns of arrivals and departures of American ships at the ports in his district, which must correspond, as far as consistent, with the returns from other consulates, if the ship touched at other ports, or with the records of the collector of customs at the home-port.

We also have the consul's returns of ships' fees, which must bear a certain proportion to his account for relief dues. There are also other checks which can be enforced under the direction of a vigilant superintendent of the consular service.

I think, without doubt, that the Government, by the proposed plan, would secure a larger per cent. if not the entire amount of the relief dues.

After a careful computation of the disbursements of the past, and considering the possibility of a certain degree of irregularity at times, until the unfaithful officer is discovered, and also taking into mind the extent and growing importance of American commerce, I have fixed the amount of tax, to be known as "relief dues," at one-half of a cent per ton of registered tonnage. I am confident that this rate will meet the demands of our destitute seamen under an efficient administration of the law.

THE EFFECT OF THE PROPOSED PLAN.

By a little comparison of amounts it will be found that the tax on our shipping will be less for the fact of bearing proportionately upon all vessels. For instance, a ship of one thousand tons entering a foreign port on an average twice a year, would pay \$10 in relief dues. Those making longer or shorter voyages would pay less or more. If either of these ships would discharge one seaman in the course of the year, and were the wages (extra) collected according to law, the ship would be obliged to pay from \$45 to \$60 in addition to wages, (ordinary,) or \$15 to \$20 a month. That is a sum equal to four and a half to six or nine to twelve years, respectively, of relief dues. As a result an average discharge, in a foreign port, of one seaman a year would involve the ship in an expense, in extra wages, to the amount of time and money stated.

On the contrary, if the wages were not collected for any reason whatever, right or wrong, the Government would be at an expense without any income at all. We know that all American ships, either from favoritism, the exceptions of the law, or from some other cause, do not pay extra wages when a seaman is discharged. I am not aware, however, that the same exceptions are made in extending relief to the seamen of these ships. In brief, all ships do not pay into the relief fund; but all American seamen are entitled to relief. It will be seen that the proposed system bears upon all vessels according to their tonnage. They are also relieved of the petty annoyances of seamen on the one hand and the exactions of the Government on the other.

I have also always thought it very severe upon our shipping to require extra wages, in addition to earned wages, to be paid to each and every seaman on board an American vessel sold abroad. There are also other cases in which it would be unjust to require the Government to bear the expense of relief where the ship should be responsible for the relief and sending home of the men. These special cases and others are provided for in the portion of the appended bill now under consideration.

COMPARISON OF DISBURSEMENTS AND TONNAGE.

I will insert here several statistical lists, which will show the receipts and disbursements on account of the relief of destitute American seamen, and the number of American vessels, tonnage, and crews cleared and entered from the American seaports and lake-ports for the correspondng years.

The following table will show the aggregate of disbursements and receipts from 1860 to 1870 on account of relief of destitute American seamen:

Receipts and disbursements on account of relief of destitute American seamen.

For the fiscal year ended June 30—	Disbursed.	Loss in exchange.	Total.	Receipts of extra wages and other moneys on account of destitute seamen.	Amounts refunded citizens, seamen, or their represent- atives directly from the Treasury, the amounts having been previously received at the consulates.	Excess of disbursements over receipts.	Excess of receipts over dis- bursements.
1860	\$220,982 69	None given.	\$220,982 69	\$45,920 35	.....	\$175,062 34	.....
1861*	177,738 17	†\$4,995 32	190,522 24	43,662 22	.....	146,860 02	.....
1862	174,182 90	7,249 41	181,432 31	60,134 83	\$685 72	121,297 48	.....
1863	180,364 72	19,627 07	199,991 79	103,798 85	691 37	96,192 94	.....
1864	184,670 26	23,502 83	208,173 09	119,311 33	803 71	88,861 76	.....
1865	143,413 11	9,647 77	153,060 88	83,446 91	7,339 20	69,613 97	.....
1866	165,462 32	4,399 27	169,825 59	87,398 73	1,206 50	82,426 86	.....
1867	135,583 19	2,422 54	138,005 73	92,442 31	575 46	45,563 42	.....
1868	93,877 51	1,520 35	95,397 86	76,170 19	3,718 54	19,227 67	.....
1869	66,592 73	1,468 16	68,060 89	34,533 59	4,047 96	33,527 30	.....
1870	80,155 19	1,353 42	81,508 61	39,038 33	10,844 75	42,470 28	.....
1871	61,499 29	883 31	62,312 60	30,729 58	3,640 86	31,583 02	.....

Allowances out of funds of seamen as balance of extra wages or arrears due estates of deceased seamen, \$502.42, to June 30, 1862.

Allowed seamen picked up at sea, \$11,896.36, to June 30, 1862.

The amount of \$2,039.51 was also disbursed during the year 1863 for relief of seamen by others than consular officers.

* For the year 1861 an additional amount of \$7,788.75 was expended for the relief of destitute American seamen, by authority of a special act.

† Net.

A statement exhibiting the number of American vessels, with their tonnage and crews, cleared from and entered into the ports of the United States, engaged in the foreign trade, from 1860 to 1870, compiled from the monthly report (April, 1872) of the Chief of the Bureau of Statistics of the Treasury Department.

For the fiscal year ended June 30—	CLEARED.								
	AMERICAN VESSELS.								
	Sea-ports.			Lake-ports.			Total.		
	Vessels.	Tons.	Crews.	Vessels.	Tons.	Crews.	Vessels.	Tons.	Crews.
1860	7,757	3,505,801	111,121	4,925	2,660,123	69,624	12,682	6,165,924	180,745
Total, 1856-'60, (5 years).....	38,071	16,895,218	543,871	19,738	8,177,121	249,133	57,809	25,072,339	793,004
Total, 1851-'60, (10 years).....	72,353	30,606,914	1,016,068	32,757	12,643,694	443,327	105,110	43,250,608	1,459,395
1861	7,785	2,877,806	90,909	4,294	2,011,507	56,291	11,079	4,889,313	147,200
1862	5,804	2,573,373	76,812	4,647	2,388,445	56,849	10,451	4,961,818	133,661
1863	4,826	2,267,290	68,499	4,703	2,179,971	54,381	9,529	4,447,261	122,880
1864	3,774	1,664,083	53,354	4,203	1,426,865	46,092	7,977	3,090,948	99,446
1865	4,204	1,676,183	55,705	4,230	1,348,951	45,162	8,434	3,025,134	100,867
Total, 1861-'65, (5 years).....	25,393	11,058,735	345,279	22,077	9,355,739	258,775	47,470	20,414,474	604,054
1866	4,472	2,032,700	68,291	4,172	1,350,476	41,254	8,644	3,383,176	109,545
1867	4,754	2,271,663	72,576	3,647	1,147,839	33,951	8,401	3,419,502	106,527
1868	5,503	2,628,709	83,973	4,148	1,089,247	34,193	9,651	3,717,956	118,166
1869	5,377	2,503,672	78,653	4,282	877,691	23,926	9,659	3,381,363	102,579
1870	5,469	2,530,066	75,128	5,020	976,863	27,101	10,489	3,506,929	102,229
Total, 1866-'70, (5 years).....	25,575	11,966,810	378,621	21,269	5,442,116	160,425	46,844	17,408,926	539,046
Total, 1861-'70, (10 years).....	50,968	23,025,545	723,900	43,346	14,797,855	419,200	94,314	37,823,400	1,143,100

For the fiscal year ended June 30—	ENTERED.								
	AMERICAN VESSELS.								
	Sea-ports.			Lake-ports.			Total.		
	Vessels.	Tons.	Crews.	Vessels.	Tons.	Crews.	Vessels.	Tons.	Crews.
1860	7,395	3,308,605	106,547	4,811	2,612,680	63,553	12,206	5,921,285	170,100
Total, 1856-'60, (5 years).....	37,047	16,383,076	532,934	19,540	8,306,353	246,606	56,587	24,689,429	779,540
Total, 1851-'60, (10 years).....	70,011	29,364,106	981,240	33,216	13,232,713	449,614	103,227	42,596,819	1,430,854
1861	6,931	3,036,461	94,801	4,320	1,987,456	54,903	11,251	5,023,917	149,704
1862	5,963	2,638,951	79,571	4,842	2,478,734	59,466	10,805	5,117,685	139,037
1863	5,183	2,312,993	70,846	4,861	2,301,705	59,527	10,044	4,614,698	130,373
1864	3,762	1,659,371	55,308	4,037	1,407,063	44,446	7,799	3,066,434	99,754
1865	4,096	1,619,494	54,871	4,228	1,324,167	43,699	8,324	2,943,661	98,570
Total, 1861-'65, (5 years).....	25,935	11,267,270	355,397	22,288	9,499,125	262,041	48,223	20,766,395	617,438
1866	4,356	1,899,994	63,814	4,490	1,472,066	46,436	8,846	3,372,060	110,250
1867	4,708	2,152,550	70,990	4,100	1,302,502	38,488	8,808	3,455,052	109,472
1868	5,276	2,480,330	81,064	4,408	1,070,220	35,088	9,684	3,550,550	116,152
1869	5,386	2,474,255	78,962	4,542	928,413	26,714	9,928	3,402,668	105,676
1870	5,616	2,466,749	75,332	5,181	1,019,289	29,376	10,797	3,486,038	104,708
Total, 1866-'70, (5 years).....	25,342	11,473,878	370,162	22,721	5,792,490	176,096	48,063	17,266,368	546,258
Total, 1861-'70, (10 years).....	51,277	22,741,148	725,559	45,009	15,291,615	438,137	96,286	38,032,763	1,163,696

Annual averages of vessels entered and cleared in the foreign trade of the United States by decades.

Annual averages for the period from—	AMERICAN VESSELS.								
	Sea-ports.			Lake-ports			Total.		
	Vessels.	Tons.	Crews.	Vessels.	Tons.	Crews.	Vessels.	Tons.	Crews.
1851 to 1860, (10 years.) { Entered	7,001	2,936,410	98,124	3,322	1,323,271	44,962	10,323	4,259,681	143,086
{ Cleared	7,235	3,060,691	101,606	3,276	1,264,369	44,333	10,511	4,325,060	145,939
1861 to 1870, (10 years.) { Entered	5,128	2,274,115	72,556	4,501	1,529,161	43,814	9,629	3,803,276	116,370
{ Cleared	5,097	2,302,555	72,390	4,334	1,479,786	41,920	9,431	3,782,341	114,310
1870 to 1871, (1 year.) { Entered	5,670	2,628,733	77,701	5,045	1,114,007	29,926	10,715	3,742,740	107,627
{ Cleared	5,643	2,636,335	76,459	4,930	1,110,610	29,146	10,573	3,746,945	105,605

STATEMENT OF AVERAGES.

From the statistical tables above given I have been able to compute the averages for a series of years relating to the number of seamen per ton or tons, per vessel, and average cost of relief tax upon vessels, &c., and also the results of the proposed plan.

AVERAGE OF SEAMEN TO TONS.

1851 to 1860, (10 years.)	Annual average....	{ Entered, 1 seaman to every 29+tons. Cleared, 1 seaman to every 29+tons.
1861 to 1870, (10 years.)	Annual average....	{ Entered, 1 seaman to every 32+tons. Cleared, 1 seaman to every 33+tons.
1870 to 1871, (1 year.)	Annual average....	{ Entered, 1 seaman to every 34+tons. Cleared, 1 seaman to every 35+tons.

AVERAGE OF SEAMEN TO VESSELS.

1851 to 1860, (10 years.)	Average of seamen to each vessel...	{ Entered, 14—seamen. Cleared, 14—seamen.
1861 to 1870, (10 years.)	Average of seamen to each vessel...	{ Entered, 12+seamen. Cleared, 12+seamen.
1870 to 1871, (1 year.)	Average of seamen to each vessel	{ Entered, 10+seamen. Cleared, 10—seamen.

1861.—Total cleared, sea-ports and lake-ports: vessels, 12,682; tons, 6,165,924; crews, 180,745.

Total disbursed for relief of seamen, as per accounts.....	\$220,982 69
Average cost of relief per seaman.....	1 22½
Average cost of relief per vessel	17 42½+
Average cost of relief per ton	3½—
Total received for extra wages, &c	45,920 35
Proportion of receipts compared with disbursements, 20 per cent.	
Average receipts per vessel.....	3 62
Excess of disbursements and moneys refunded.....	175,062 34

Proposed plan.—Relief dues one-half of a cent per ton on 5,921,281 registered tonnage, average two entries a year at a foreign port, \$59,212.81.

1865.—Total cleared, sea-ports and lake-ports: vessels, 8,434; tons, 3,025,134; crews, 100,867.

Total disbursed for relief of seamen, as per account.....	\$153,060 88
Average cost of relief per seaman.....	1 51½+
Average cost of relief per vessel	18 11 +
Average cost of relief per ton.....	5½—
Total received from extra wages, &c	83,446 91
Proportion of receipts compared with disbursements, 55 per cent.	
Average receipts per vessel	9 89+
Excess of disbursements and moneys refunded.....	69,613 97

Proposed plan.—Relief dues of one-half of a cent per ton on 3,025,134 registered tonnage, average two entries per year at foreign ports, \$30,251.34.

1870.—Total cleared, sea-ports and lake-ports: vessels, 10,489; tons, 3,503,929; crews, 102,229.

Total disbursed for relief of seamen, as per accounts	\$31,503 61
Average cost of relief per seaman	79 $\frac{3}{4}$ —
Average cost of relief per vessel	7 77 +
Average cost of relief per ton	2 +
Total received from extra wages, &c.	39,038 33
Proportion of receipts compared with disbursements, 90 per cent.	
Average receipts per vessel	3 72 +
Excess of disbursements and moneys refunded	42,470 28

Proposed plan.—Relief dues of one-half of a cent per ton on 3,503,929 registered tonnage, average two entries per year at foreign ports, \$35,069.29.

1871.—Total cleared, sea-ports and lake-ports: vessels, 10,573; tons, 3,746,945; crews, 105,605.

Total disbursed for relief of seamen, as per accounts	\$32,312 60
Average cost of relief per seaman	59 +
Average cost of relief per vessel	5 89 +
Average cost of relief per ton	1 $\frac{3}{4}$ +
Total received for extra wages, &c.	30,729 58
Proportion of receipts compared with disbursements, 50 per cent.	
Average receipts per vessel	2 90 +
Excess of disbursements and moneys refunded	31,583 02

Proposed plan.—Relief dues of one-half of a cent per ton on 3,746,945 registered tonnage, average two entries per year at foreign ports, \$37,469.45.

These figures, from official sources, need no comment. The inefficiency of the service was probably at its height in 1860. For 1865 there was considerable expenditure in proportion to the number of vessels, tonnage, and crews. This may be accounted for as the results of depredations of privateers. In 1870 and 1871 these figures take a more flattering turn, and indicate a more accountable administration of the laws. Appended to these exhibits is an estimate of return of relief dues according to tonnage and an average of two entries a year at a foreign port. With the special cases hereinafter enumerated, in which the ship is required to bear part or all of the expense of relief and passage home, I am of the opinion that the relief dues can even be reduced to a lower rate than that proposed.

ON THE GRANTING OF RELIEF.

The succeeding sections designate how, when, and to what extent relief shall be granted to destitute American seamen. In a general way the bill authorizes consular officers to extend relief to all seamen, citizens of the United States, who may be found in a destitute condition in their consulates or consular districts.

This relief, with certain modifications, is also allowed to seamen, citizens of the United States, arriving on vessels other than American. In order to prevent abuses, or, at least, to discover the same, the Secretary of the Treasury is authorized to require information from collectors of customs in the United States, and may appoint a secret agent to act within the United States, under the especial direction of the superintendent of the consular service, for the purpose of investigating ships' papers in custom-houses, or visiting the shipping and seamen, with a view to hearing or investigating complaints. Consular officers are required to see that agreements are complied with. Returns are required to be made in case a ship is lost or sold abroad. No seamen can be legally discharged abroad, nor be left behind, without the sanction

of the consul, and a violation of this is punished with a penalty. If any of the crew of any American ship be left behind, the proof of sanction or authority is put upon the master, and failing to produce satisfactory proof, the whole expense of relief must be charged against the ship, and collected from the owner. On the discharge of seamen abroad by sale of ships or otherwise, certificates of discharge must be given, and the seamen sent home. In the case of sale, the master must pay the seamen's wages in full, and provide them with passage home, or deposit with the consul a sum per man equal to the Government rate of allowance for that purpose. Forcing a seaman on shore, a common occurrence at present, to avoid extra wages, and accomplished in collusion with the consular officer, who certifies the men as deserters, is made a misdemeanor.

The vessel pays the same dues under any and all circumstances. The amount in this case of relief is chargeable against the ship. There would be little or no inducement to the consul to violate his trust. There would be no forty to sixty dollars a man extra wages to be charged or abated, according to circumstances. The consul would hardly find it now worth the risk. But allowing, for a smaller consideration, the expense of relief, in this instance, was charged to the Government instead of the ship, a vigilant use of the secret agent at home would sooner or later discover sufficient evidence to warrant the dismissal of the officer. Extra wages, like high customs or internal duties, instead of increasing the revenue, act in the opposite extreme, and often become a corrupting fund.

The bill further provides that seamen, when allowed to be left behind, must be paid their wages, and prescribes how the said wages shall be disposed of. Such wages must be treated as money due to seamen. The bill next explains in relation to the discharge of seamen at foreign ports; that destitute seamen are to be sent home, and how; that reasonable compensation may be paid where there is no consular officer; the Government may sue for the amount advanced for the relief of seamen left abroad; masters are required to seek the services of consular officers; it is the duty of a master, upon arriving in a foreign port, to deposit his papers with the consular officer of the United States, and the same with respect to the agreement abroad, and at home with the collector of customs; seamen engaged in a foreign port must be shipped with the sanction and in the presence of the consul; proceedings in the shipment of seamen are defined; consuls are empowered to require the production of agreement, muster-rolls, &c.; seamen must be allowed to go ashore to make complaints to a consular officer; forfeiture for frivolous complaint; masters and seamen can make complaints to consuls, and providing for the appointment of inspectors; consular officers are required to enforce the laws of the United States relating to discipline on American ships; consular officers required to reclaim deserters and to inquire into the cause of desertions. The bill further explains the course to be pursued respecting desertions, and prescribes the penalty for neglect of duty.

For details concerning the above provisions, I would respectfully call your attention to Sections CII to CXXXIV, inclusive.

RELATING TO INVOICES.

The fourth chapter of the appended bill is devoted exclusively to the important subject of the verification and authentication of invoices and the duties of consular officers of the United States therein. This por-

tion of the bill begins by repealing the acts inconsistent with this, the terms used are defined, and persons declaring to the invoice are required to be the persons named therein.

VERIFICATION OF INVOICES.

The verification of invoices by the present laws requires an oath before a consular officer. Like the collection of extra wages, this oath is at some consulates a medium of unjust exactions. I now allude to the additional charge for administering the oath of verification by a person known as a commissioner. This applies to the verification of invoices in the British Isles. I am informed that English laws do not permit a consular officer to administer an oath, and, in the absence of any consular convention to authorize these officers to perform this duty, a person having an invoice to be verified must first take oath before a commissioner, who inflicts a charge of from 60 cents to \$1.50. In addition to this, the fee of \$2.50 is also charged and collected by the consul and accounted for to the Government.

STATEMENT OF COMMISSIONERS' FEES.

Before going further, I will here give an approximation of the amount of these commissioners' fees:

Commissioners' fees collected in the British Isles for the fiscal year ended June 30, 1872.

Consulate.	Number of invoices.	Commissioners' fees.		Total of commissioners' fees.	Total Government fees.	Remarks.
		s.	d.			
1. Belfast	4,775	2	6	\$0 60	\$2,865 00	\$11,937 50 1871.
2. Birmingham	4,847	2	6	60	2,908 20	12,117 50
3. Bradford	7,795	2	6	60	4,677 00	19,487 50
4. Bristol	400	2	6	60	240 00	1,000 00 1871. Approximation.
5. Cardiff	253	4	6	1 09	275 77	632 50
6. Cork	1,000	2	6	60	600 00	2,500 00 Approximation.
7. Dublin	800	2	6	60	480 00	2,000 00 Approximation.
8. Dundee	2,883	2	6	60	1,729 80	7,207 50
9. Falmouth	50	2	6	60	30 00	125 00 Approximation.
10. Glasgow	4,671	2	6	60	2,802 60	11,677 50
11. Leeds	1,000	6	0	1 45	1,450 00	2,500 00 Approximation.
12. Leith	1,100	2	6	60	660 00	2,750 00 Approximation.
13. Liverpool	10,768	2	4	56	6,030 08	26,920 00 1871.
14. London	19,845	2	6	60	11,907 00	49,612 50
15. Londonderry	100	2	6	60	60 00	250 00 1871. Approximation.
16. Manchester	13,297	3	0	72	9,573 84	33,242 50
17. Newcastle-on-Tyne	75	2	6	60	45 00	187 50
18. Plymouth						
19. Sheffield	3,550	2	6	60	2,130 00	8,875 00 1871. Approximation.
20. Southampton	100	2	6	60	60 00	250 00 1871. Approximation.
21. Tunstall	3,550	2	6	60	2,130 00	8,875 00 1871. Approximation.
Total	80,859				50,654 29	202,147 50

By the above table it will be seen that the large sum of \$50,654.29 is paid, by the parties shipping goods to the United States, to a class of men not even citizens of the United States. This sum is ultimately paid by the American consumer.

At the principal consulates it will be seen that these fees aggregate as high as \$11,907. I am aware of the fact that in most cases the commissioner is the vice-consul, or a special commissioner is employed to administer these oaths. At London, Manchester, and Bradford, these

fees largely exceed the salaries of the officers, and at Liverpool they amount to nearly that sum. I must admit that I am not sufficiently credulous to believe that these large amounts go exclusively to the commissioners, and that the consul has no benefit or profit directly or indirectly therein. Presuming, however, that this view be incorrect, we would have the following figures:

London, consul's salary, \$7,500; commissioner's fees, \$11,907.

Manchester, consul's salary, \$3,000; commissioner's fees, \$9,573.84.

Bradford, commercial agent's salary, \$2,500; commissioner's fees, \$4,677.

Liverpool, consul's salary, \$7,500; commissioner's fees, \$6,030.08.

Allowing that 50 per cent. of these fees go to the commissioner, which would be a larger salary than the majority of our consular officers receive, we find a large sum unaccounted for. Under any and all circumstances I consider these commissioners' fees demoralizing in tendency, and a useless and unnecessary tax.

I am informed that several incipient efforts have been made looking to a consular convention between the United States and Great Britain, but that the negotiations culminated in no definite arrangement between the two countries.

There is an inconsistency also in this matter of oaths, which I have failed to have explained. In some cases I found that the consul administered the oath; for instance, in case of extended protest, or the oath of master to desertion, or to an American seaman for use in the United States, &c. This being the fact, I cannot see why officers should not administer the oath, if such were necessary to declaration.

Again, in the case of invoices, the document is entirely for use in the United States. If the document were for use in a British court the case might be different.

In order to put an end to this unnecessary expense, I propose, in the appended bill, the requirement of a simple declaration before a consular officer of the United States instead of an oath. In my opinion, any one who would make a false declaration with a view to defrauding the revenue would not stop short at an oath. The declaration, however, for the purposes of the act is stated to have the force and effect of the oath hitherto required. Nor does the oath put any more of a check upon the consular officer, for if he accedes to an undervaluation, it matters not to him whether verification is by oath or declaration alone.

A practice with some parties is to make out one set of invoices to pass through the consulate and custom-house, and another set, with the actual prices paid, to be sent to the persons receiving the goods in the United States. I am not aware that a simple oath administered by a commissioner, or any one else, will have any effect in correcting this evil.

In my opinion, there is a better plan to protect the revenue than the requirement of invoices, but invoices are good enough as far as they go, and they bring in a revenue to help defray the expense of the consular service. By doing away with the verification of invoices before a consular officer of the United States, at least three-fifths of the consulates could be dispensed with. The remainder, however, with the consular fees for services rendered to ships and authentication of signatures, &c., would pay but a share of the expense of those remaining.

As an offset to the oath required at the consulates on the British Isles, on the continent I find that a formal oath is not always asked for, but merely the signature of the party. I have not learned that the attempts to defraud the revenue are more frequent or more successful in the one case than the other.

In the appended bill I have embraced considerable detail, which I am of the opinion is necessary to insure greater accountability and efficiency in this branch of the consular business.

In order to enable you to form some idea of the confusion existing on the British Isles on this subject, I will take the liberty of quoting from some official correspondence. The proposition in this case is the proper place of invoice.

OFFICIAL CORRESPONDENCE IN REGARD TO THE PROPER PLACE OF INVOICE.

The first letter is from Consul-General Badeau, dated at London, December 2, 1870, and addressed to Mr. Reid, the deputy consul at Dundee, Scotland. He says:

In the case of a shipper doing business in Dundee, buying goods in Glasgow, and shipping them thence to New York, the invoice should be verified at Glasgow, if the shipper purchased them there in person. If he bought or ordered by letter from Dundee, then Dundee would be the place of shipment.

Mr. Jenkinson, consul at Glasgow, in a communication dated February 29, 1872, states the following case:

The facts are briefly as follows: An invoice was produced to me, by a gentleman residing in Glasgow, of goods made and shipped from Liverpool to the United States. I declined to certify it, because the regulations require that it should be done by the consul at Liverpool, who was the consul nearest to the place of shipment. The consul-general instructed me to grant my certificate in this and all like cases, at the same time referring to and indorsing a decision of the former Assistant Solicitor of the Treasury, whose interpretation of the law was that the place of shipment meant the place where the shipper resided, and from which he gave his order. The decision was contrary to the instructions from the State Department, and, as I thought, contrary to law, and would change my practice entirely.

The question was finally submitted to the State Department, and referred by that Department to the Treasury Department. The answer finally communicated to me by the consul-general was as follows, under date of March 15, 1871: That paragraph 463, in Consular Regulations, shall stand as it now reads. In regard to this last, the honorable Secretary of the Treasury remarks that it seems especially appropriate that the invoice should be certified by the consul, who has opportunities of seeing the goods and knowing their value. * * * I think that in your case there can be no doubt that the Department intends you to revert to your former practice.

In another communication from the consul-general at London, dated March 7, 1872, addressed to Mr. Robinson, consul at Leith, in answer to one received, I find the following on the subject of verification of invoices:

I have to say that this whole matter was referred by me to the State Department some months since, together with communications from various consuls and merchants on the subject, in addition to which various shippers addressed the Government direct. The State Department referred all these papers to the Treasury, and after long waiting the Treasury Department, in an elaborate document, a copy of which was forwarded to me for my governance, decided to sanction the verification of invoices under circumstances similar to those which you describe, on the ground, in certain cases, that the same house being, say, at Manchester, and branch houses elsewhere, trade would be facilitated by allowing the invoices to be certified at the place where the main establishment was situated, and adopting the rule laid down by the Assistant Solicitor of the Treasury in a formal opinion delivered by him to the State Department, September 17, 1866, in which he states that the place of shipment may mean the place where the goods are ordered. This decision of the Treasury was first made (since I have held my present office) in July last, and was a partial reversal of a previous one; but it was twice received in October, 1871, and may therefore be considered as a definite determination of the Department. I have, of course, acted in conformity with it, and sanctioned expressly the course pursued at Manchester. * * *

The rule itself is declared, and the examples of its application have been furnished with great exactness, it being expressly declared that the consular regulation on the subject is not to be inflexibly applied according to its most obvious meaning, but to be construed in accordance with the opinion of the Solicitor of the Treasury alluded to.

These communications convey several important facts which I have often found cause great embarrassment.

First. The difficulty of obtaining prompt instructions from the Government.

Secondly. The circumlocution necessary to secure proper instructions from the proper Department.

Thirdly. Unsatisfactory decisions by officers not specially charged with the administration of consular affairs, and hence not familiar with its peculiar wants. I will take the liberty of saying that I consider the decision alluded to as indefinite and calculated to disturb the mode of verifying invoices.

I will add as my opinion that exceptions to laws, consular, for the purpose of facilitating trade, are measures of doubtful wisdom, and are generally concessions under misapprehension, misstatement, or an exaggeration of circumstances. To permit goods to be invoiced where ordered, is equivalent to a nulification of all regulations on the subject under consideration. It is like setting law aside, and putting the consular service under the direction of agents of mercantile houses residing abroad.

There are other suggestive features of this correspondence which will suggest themselves upon perusal. These have appeared in my former report in connection with a practical application of my own experience. I presume it will be appreciated that a consular bureau as proposed would remedy much of the inconvenience alluded to.

PROPOSED RULES FOR VERIFICATION, ETC.

The appended bill defines in precise terms by whom invoices shall be verified, namely, by the manufacturer, the real owner, the seller, or the purchaser, and only by the agent of any of the above persons under certain limitations. This does away with the evasion of the laws by having outside parties swear to declaration. The place where the declaration to the invoice shall be made is also clearly defined.

First. At the place or in the consular district of manufacture.

Secondly. At the place or in the consular district of general store, if the market be actually supplied, or if the actual sale be made therefrom.

Thirdly. In countries lying adjacent to the United States, at the place or in the consular district nearest to the port or place of clearance for the latter.

Next follows a section explanatory of verifications in certain cases.

First. Goods manufactured or bought in one consular district, and ordered by an agent or other person residing in another district, must be invoiced in the district of manufacture.

Secondly. Goods manufactured in one consular district and shipped to another for sale, must be invoiced in the consular district where sold, but in no case must the law be construed to mean that goods manufactured in one district, and bought by an agent residing in another, must be invoiced in the district in which the agent resides, unless the goods shall have actually been at the place of invoice, in the said district, and bought there within the terms of the act.

Thirdly. No single invoice can cover goods other than those manufactured or bought at the same place or in the same consular district.

Fourthly. No single invoice can cover goods shipped by two or more vessels.

The remaining sections of this portion of the bill (Sections CXLIII, CXLIV, CXLV, CXLVI, and CXLVII) state the general rules to be

observed in all invoices, require declarations to give the market value at the time, define the currency in which invoices shall be made, prescribe rules for samples, and require consular officers to inform themselves respecting currencies, measures, weights, prices, and all other matters to insure accuracy in invoices.

I have found that parties have attempted to undervalue goods on the plea of prices for cash, or that the goods had been bought at that price some months before. The bill requires the market value at the time and place of invoice.

In regard to samples I will say that the present plan imposes a considerable labor and expense upon the importer to the United States without a corresponding return of benefit to the service. During my investigations at Lyons, France, I was informed that a thousand pounds of silk in samples had accumulated in the consulate. At Basle, in Switzerland, at least five thousand samples of silk had accumulated. I presume it would be safe to say that none of these samples have ever been called upon to verify the quality of silk, and, with the limited allowance for the care of consular property and archives, these samples are an actual incumbrance.

MISCELLANEOUS RELATING TO INVOICES.

Some important memoranda from my official journal I will here note, that they may be preserved in connection with the foregoing suggestions concerning the invoice business of consuls.

The shipper of goods, as such, should not be allowed to invoice goods under any circumstances. If he come under the head of any of the persons allowed to do so by the bill, it should be in that capacity alone.

Goods sent from the place or district of manufacture or sale, to an agent residing at a sea-port, to be invoiced by him as shipper, should not be allowed.

Invoices should be made out in the currency actually paid for the goods. For instance, a merchant of Liverpool buys goods in Germany, and pays in pounds sterling; the invoice should be made in the same. Invoices should not be received for goods already shipped, unless having bonds given.

Merchants should be required to come to the consulate in person, if practicable, and not by representative. Invoices should be at the full market value at the time of invoice, and no allowance to be made for cash or purchases some time before when prices were lower. Goods manufactured in one country, and sold in another for shipment to the United States, should be invoiced at the market value in the country and at the time of sale when invoiced for the United States.

Invoices should only be at the places specified in the laws.

Illustration: An American firm sends over its agents, who purchase goods at different places and send invoices to their financial agent in another district, who declares to the invoices in his district. Another case: One hundred and thirteen bales of jute were invoiced at £3,845 4s. 11d. at Glasgow, while one hundred and seventeen bales of the same about the same time were invoiced at Liverpool at £633 7s. 10d.

It is apparent that the difference above could not occur were the invoice laws better defined. The above case has been reported.

ATTEMPTS TO DEFRAUD THE REVENUE.

On this subject I gathered considerable information. Its use, however, I have confined to a practical application of measures to prevent the continuance of such attempts, as far as invoices are concerned.

JUDICIAL POWERS OF CONSULS.

The fifth chapter of the appended bill relates to the judicial functions of consular officers of the United States, exercised in certain countries. Although this is a portion of the consular business of great importance, my report of May 22, 1872, page 159 to 166, and page 249 to 305, treats on the subject so fully that I have nothing more to say. I discovered numerous imperfections in the practice of the powers authorized by the act of June 22, 1860. The bill appeared to me as possessing many good features, but lacked a few details to give it a proper subordination and responsibility to the Government. The act approved July 1, 1870, instead of accomplishing this, destroyed much of the force of the old law and introduced a new feature which, in the excess of precaution, appears more like a parody on justice than a serious proposition granting the right of appeal in certain cases.

In the judicial chapter of the appended bill the best features of the act of 1860 are retained, but the largest portions are new.

In the new sections or amended old ones the consular judicial powers are specially defined, and the extent of their authority is stated; the responsibility of officers is clearly set forth; the appointment and duties of consular interpreters, marshals, and constables, are placed upon a new basis, and the places of their residence fixed in accordance with the present needs of the service; the mode of preparing general regulations for the government of the consular courts of the United States is prescribed; consular judicial fees are required to be accounted for to the Government; consular courts are declared courts of record; a register of citizens is required to be kept; the application of the act to divers countries is plainly stated; the superior authority over consular courts is vested in the Secretary of State; consuls-general, or consuls of the highest class in the country, are given supervisory powers; the powers of vice-consuls are defined; the mode of procedure in arrests and trials, in all cases, is stated; provisions are made for appeals and arbitrations in certain cases; the rules for the government of cases of a criminal nature, and how criminals shall be executed, are provided; power is given to send persons charged with crime to the United States; ministers are to have original jurisdiction in cases in which consuls are interested; appeals may be made from ministers in criminal cases; a police report is required to be kept at consulates; citizens sent out of the country are to be reported; returns of civil suits must be made; prisons are only to be opened with the sanction of the President; consuls are authorized to call upon the local governments for assistance; the powers of consuls in marriages are stated, and reports upon the means of executing sentences must be made at certain times.

COMMENCEMENT OF THE ACT.

The commencement of the act in my opinion should be at the earliest moment. The appended bill contemplates the immediate going into operation of the parts organizing the bureau of the consular service, and the remaining portions as soon as practicable thereafter.

CONCLUSION.

In conclusion, I would respectfully state that it is my sincere hope that my labors in these consular investigations may be the means of leading to some action in the very important matter of a re-organization

of the consular service of the United States, so that it may be worthy of us as a great commercial nation. I presume I have, in some instances, spoken plainly. I have purposely endeavored to do so, that my meaning might not be misinterpreted or misunderstood. I hope, however, I have not gone beyond the bounds of official dignity.

My investigations have included a long list of consulates, illustrating every phase of the consul's duty, and every grade of consulate.

THE APPENDED CONSULAR BILL.

In addition to my communications addressed to you from the countries and cities visited by me, I kept notes of every point which might have more or less bearing upon the preparation of a bill to establish a suitable consular service.

In my report of May 22, 1872, I presented a draught of a bill with a view to the same end. That bill embodied the practical information I had obtained up to that time. I also embraced in it some provisions for the protection of American seamen at home and abroad. In the present bill, revised and enlarged in its consular features, I have omitted those parts relating to seamen, except they relate to the duties of consuls therein.

The new portions of the present bill, as compared with that in my previous report, are the classification of consular officers, the allowance for rents and office-expenses, the mode of appointing and paying for clerks, the relief of destitute seamen, and the verification of invoices. I presume some of these provisions will meet with opposition, for it may be considered that the measures are too radical a change. This I admit. With such a service as we have, it must be a radical re-organization to make anything worthy of the name "consular service."

In connection with the general observations I have made upon the defects of the present service, and the explanatory comments which I have made upon my own propositions, I would herewith respectfully submit, as embodying all my recommendations for consular re-organization, the inclosed bill "to establish a consular service for the United States of America, and to amend and to consolidate sundry acts of Congress relating to the powers and duties of consular-officers."

I have the honor to be, sir, your obedient servant,

DE B. RANDOLPH KEIM,

Agent of the United States, &c.

Hon. GEO. S. BOUTWELL,

Secretary of the Treasury, Washington, D. C.

A BILL

TO ESTABLISH A CONSULAR SERVICE FOR THE UNITED STATES OF AMERICA,
AND TO AMEND AND TO CONSOLIDATE SUNDRY ACTS OF CON-
GRESS RELATING TO THE POWERS AND DUTIES
OF CONSULAR OFFICERS.

PREPARED TO ACCOMPANY THE REPORT OF

DE B. RANDOLPH KEIM,

AGENT OF THE UNITED STATES FOR CONSULAR AFFAIRS, ETC.,

UPON THE CONDITION OF THE CONSULAR SERVICE OF THE
UNITED STATES OF AMERICA.

DECEMBER 31, 1872.

REPORT OF THE COMMISSIONER OF THE LAND OFFICE

CHAPTER I

SECTION 1. The land office was established by the act of the General Assembly of the State of New York, passed on the 1st day of January, 1814, and continued by subsequent acts of the Legislature. It was originally organized by the appointment of a Commissioner, who was to hold office for three years, and was to be elected by the Senate and Assembly, in joint session, on the 1st day of January, in each year.

SECTION 2. The Commissioner of the Land Office is to be elected by the Senate and Assembly, in joint session, on the 1st day of January, in each year, for a term of three years, and may be re-elected.

SECTION 3. The Commissioner of the Land Office is to be the chief officer of the Land Office, and is to have the management and control of the same.

SECTION 4. The Commissioner of the Land Office is to be the keeper of the records and documents of the Land Office, and is to have the custody of the same. He is also to be the keeper of the books and accounts of the Land Office, and is to have the custody of the same. He is also to be the keeper of the maps and charts of the Land Office, and is to have the custody of the same.

ARRANGEMENT OF THE SECTIONS OF THE BILL.

PRELIMINARY.

- Section I. Repealing certain laws, but said repeal not to affect matters pending under the present laws.
Section II. Acts, in whole or in part, relating to the duties of consuls, not to be repealed.
Section III. Short title of the act.
Section IV. Interpretation of terms used in this act.
Section V. The powers and duties expressed in this act not to exclude others incident to the appointment or treaty, &c.
Section VI. Exemption of ships belonging to the United States.
Section VII. Penalties for forgery of seal and fraudulent alteration of forms, and for not using forms issued by the Treasury Department.
Section VIII. Division of the act.

CHAPTER THE FIRST.

BUREAU OF THE CONSULAR SERVICE ESTABLISHED; ITS ORGANIZATION, DUTIES, AND POWERS.

- Section IX. Bureau of the Consular Service established.
Section X. The Bureau of the Consular Service to have charge of all matters, not diplomatic, and pertaining to the duties of consular officers.
Section XI. The principal officer of the Bureau of the Consular Service.
Section XII. Subordinates of the Bureau of the Consular Service.
Section XIII. Salaries.
Section XIV. Duties of the Superintendent of the Consular Service in regard to this and other acts.
Section XV. General duties of the Superintendent of the Consular Service.
Section XVI. Seal.
Section XVII. The organization of the Bureau of the Consular Service and duties of its respective branches.
Section XVIII. The Superintendent of the Consular Service to prepare and issue forms under the direction of the Secretary of the Treasury.
Section XIX. The Superintendent of the Consular Service to furnish lists of consular officers to collectors, &c.
Section XX. Reports to be made by the Superintendent of the Consular Service.
Section XXI. The Superintendent of the Consular Service to prepare commercial reports to be submitted to the Secretary of the Treasury for transmission to Congress.
Section XXII. Consular officers to make commercial returns to the Secretary of the Treasury.
Section XXIII. The Superintendent of the Consular Service to keep a record of books, furniture, &c., in possession of each consular officer.
Section XXIV. Certificates and documents purporting to be sealed or signed in a given manner to be received in evidence.
Section XXV. Application of moneys and fines paid into the Treasury.
Section XXVI. Consular and naval officers and officers of the customs may inspect documents and crews.
Section XXVII. The President may appoint an inspector.
Section XXVIII. Title and powers of inspector.
Section XXIX. Compensation, &c., of inspector.
Section XXX. Reports of inspector to be submitted to Congress.
Section XXXI. Penalty for obstructing inspector in the execution of his duty.

CHAPTER THE SECOND.

CONSULAR SERVICE ORGANIZED, AND PROVISIONS GOVERNING THE PAYMENT OF SALARIES, RETURNS OF FEES, ETC., AND PRESCRIBING THE GENERAL DUTIES AND POWERS OF CONSULAR OFFICERS.

- Section XXXII. Construction of terms of this act as applied to consular officers.
 Section XXXIII. Consular officers to be taken as officers of the Treasury.
 Section XXXIV. Principal officers of the consular service.
 Section XXXV. Two salaried vice-consuls-general to be appointed.
 Section XXXVI. Salaries of consular officers.
 Section XXXVII. Schedule of consulates.
 Section XXXVIII. Terms on which salaries shall be paid.
 Section XXXIX. Leaves of absence and salaries.
 Section XL. Salaries to be paid in lieu of salaries and fees formerly paid.
 Section XLI. Salaried consular officers not to transact business.
 Section XLII. Compensation to be in full.
 Section XLIII. Allowance to be made for rent of consular offices and office expenses.
 Section XLIV. Allowance for clerk hire.
 Section XLV. The President may appoint temporary consuls.
 Section XLVI. Certain consular officers, &c., to be examined.
 Section XLVII. Personal qualifications and age of candidates.
 Section XLVIII. Consular officers to be promoted.
 Section XLIX. Rule to be adopted for appointments in the commencement of the act.
 Section L. Any member of Congress may present candidates for examination.
 Section LI. Consular officers not allowed to hold two offices.
 Section LII. Superiors responsible for subordinates.
 Section LIII. Salaried consular officers must be citizens of the United States.
 Section LIV. Fees to go to unclassified consular officers.
 Section LV. Compensation of subordinate consular officers.
 Section LVI. No change of rank or compensation except by act of Congress.
 Section LVII. Commencement of duties.
 Section LVIII. Consular officers temporarily performing diplomatic duties.
 Section LIX. Consular officers not to exercise diplomatic functions unless expressly authorized.
 Section LX. Certain consular officers to give bonds.
 Section LXI. Subordinate unsalaried consular officers may be appointed.
 Section LXII. Jurisdiction of consuls-general.
 Section LXIII. Jurisdiction of consuls-general continued; list of consulates-general.
 Section LXIV. Extent of supervisory powers.
 Section LXV. How consular jurisdictions to be settled.
 Section LXVI. Certain fees allowed to be taken; how prescribed.
 Section LXVII. Penalty on consular officers demanding more fees than specified in the schedule, or specified in any order.
 Section LXVIII. Tables of fees to be exhibited at custom-houses in the United States.
 Section LXIX. Tables of fees to be exhibited in all consular offices of the United States in foreign countries.
 Section LXX. Fees to be accounted for.
 Section LXXI. Fees taken by unclassified consular officers to be accounted for.
 Section LXXII. Reducing consular fees on certain vessels.
 Section LXXIII. Fees, how to be collected.
 Section LXXIV. List of returns and accounts to be sent to the Secretary of the Treasury.
 Section LXXV. List of seamen to be kept.
 Section LXXVI. Consular books of record, and invoice, and accounts, to be opened to public inspection by persons interested.
 Section LXXVII. Blanks, &c., to be furnished.
 Section LXXVIII. Prices-current, &c., to be furnished to the Secretary of the Treasury.
 Section LXXIX. Collection of hospital dues.
 Section LXXX. Oaths may be administered by consuls.
 Section LXXXI. Consular officers may receive protests, declarations, &c.
 Section LXXXII. Penalty of false certificate to invoices and other papers.
 Section LXXXIII. Penalty of false certificate of ownership.
 Section LXXXIV. Penalty for illegally issuing passport, &c.
 Section LXXXV. Relating to powers of attorney.
 Section LXXXVI. Neglect of duty.
 Section LXXXVII. Penalty for neglect to render accounts.
 Section LXXXVIII. Consular courts of inquiry.

- Section LXXXIX. Penalty for using the American flag except according to law.
 Section XC. Revision of section 4 of the act prohibiting the cooly trade.
 Section XCI. Unpaid letters for the United States at foreign ports to be forwarded to the Superintendent of the Consular Service.
 Section XCII. Consular officers not to correspond for newspapers, &c.
 Section XCIII. The agent and consul-general in Egypt.
 Section XCIV. Consular officers to take possession of estates of American citizens other than seamen dying abroad, if the laws permit.
 Section XCV. Duties of consular officers in estates of citizens of the United States in certain countries dying abroad.
 Section XCVI. Consular officers to execute the laws of the United States relating to crimes of citizens of the United States on the high seas, &c.
 Section XCVII. For the safe custody and conveyance of prisoners to the United States.
 Section XCVIII. As to the conveyance of offenders and witnesses to the United States.
 Section XCIX. Duties of consular officers in cases of stranded vessels.
 Section C. Admission of certain documents, &c., under the consular seal in evidence.
 Section CI. Naval officers of the United States in certain cases may exercise the powers of consuls.

CHAPTER THE THIRD.

THE RECIPROCAL DUTIES OF CONSULAR OFFICERS OF THE UNITED STATES AND MASTERS OF AMERICAN SHIPS, AND FOR THE PROTECTION AND RELIEF OF DESTITUTE AMERICAN SEAMEN AT FOREIGN PORTS OR PLACES.

- Section CII. Repealing acts inconsistent with this act.
 Section CIII. The Superintendent of the Consular Service and consular officers to carry out acts relating to seamen.
 Section CIV. Seamen's wages to be paid when an American ship is sold abroad.
 Section CV. Relief dues to be paid in lieu of extra wages.
 Section CVI. Consular officers of the United States to extend relief to destitute American seamen.
 Section CVII. Relief of American seamen arriving on other than American vessels.
 Section CVIII. The Secretary of the Treasury to require information from collectors of customs, and may appoint a secret agent.
 Section CIX. Consular officers to see that agreements are complied with.
 Section CX. Return to be made in case of ship lost or sold abroad.
 Section CXI. No seaman to be discharged abroad, nor to be abandoned or left behind, without the sanction of the consul.
 Section CXII. If any of the crew are left behind, the proof of sanction or authority to be upon the master.
 Section CXIII. On discharge of seamen abroad by sale of ship, or otherwise, certificates of discharge to be given and seamen to be sent home.
 Section CXIV. Forcing seamen on shore, &c., a misdemeanor.
 Section CXV. Seamen when allowed to be left behind to be paid their wages.
 Section CXVI. Such wages to be treated as money due to seamen.
 Section CXVII. Discharge of seamen.
 Section CXVIII. Destitute seamen to be sent home.
 Section CXIX. Reasonable compensation to be paid where no consular officer.
 Section CXX. Power of the Government to sue for the amount advanced for the relief of seamen left abroad.
 Section CXXI. Masters to seek services of consular officers.
 Section CXXII. Duty of a master upon arriving in port to deposit papers with consular officer.
 Section CXXIII. Ship's agreement on arrival at a foreign port to be deposited with the consul, and at a home port with the collector of customs.
 Section CXXIV. Seamen engaged in a foreign port to be shipped with the sanction and in the presence of the consul.
 Section CXXV. Proceedings in the shipment of a seaman.
 Section CXXVI. Consuls empowered to require the production of the agreement, muster-roll, &c.
 Section CXXVII. Seamen to be allowed to go ashore to make complaint to a consular officer.
 Section CXXVIII. Forfeiture for frivolous complaint.
 Section CXXIX. Masters and seamen can make complaints to consuls; and appointment of inspectors.
 Section CXXX. Consular officers shall enforce laws relating to discipline on American ships.
 Section CXXXI. Consular officers to reclaim deserters.
 Section CXXXII. Consular officers to inquire into the cause of desertion.
 Section CXXXIII. Desertions.
 Section CXXXIV. Penalty for neglect of duty.

CHAPTER THE FOURTH.

RESPECTING THE VERIFICATION AND AUTHENTICATION OF INVOICES, AND THE DUTIES OF CONSULAR OFFICERS OF THE UNITED STATES THEREIN.

- Section CXXXV. Repeal of acts inconsistent with this portion of this act.
 Section CXXXVI. Definition of terms used in this portion of this act.
 Section CXXXVII. Persons declaring to the invoice must be the persons named therein.
 Section CXXXVIII. Verification to be by declaration before a consular officer, &c.
 Section CXXXIX. Verification to be by declaration and not by oath, and penalty for violation of act.
 Section CXL. By whom invoices shall be verified.
 Section CXLI. Where declaration to invoice shall be made.
 Section CXLII. Explanatory of how, when, and where invoices shall be verified in certain cases.
 Section CXLIII. General rules to be observed in all invoices.
 Section CXLIV. Declarations to give the market value at the time, and no discounts for cash, &c., to be allowed.
 Section CXLV. The currency in which invoices shall be made.
 Section CXLVI. Respecting samples.
 Section CXLVII. Consular officers to keep themselves informed respecting currencies, &c.

CHAPTER THE FIFTH.

IN RELATION TO THE EXERCISE OF JUDICIAL FUNCTIONS BY CONSULAR OFFICERS OF THE UNITED STATES OF AMERICA IN CERTAIN COUNTRIES.

- Section CXLVIII. The power acquired by the United States for its consular officers to exercise judicial powers.
 Section CXLIX. Acts done in pursuance of such power to be of the same effect as if done under local laws.
 Section CL. Definition of terms.
 Section CLI. The consul-general to have the powers in certain cases conferred in this act upon ministers.
 Section CLII. Consular officers to exercise judicial powers.
 Section CLIII. No jurisdiction to be exercised beyond the powers of the act.
 Section CLIV. Powers of consular officers in the premises.
 Section CLV. How proceedings in consular courts shall be held.
 Section CLVI. Consular judicial officers responsible as such.
 Section CLVII. Consular officers solely responsible.
 Section CLVIII. Courts authorized to procure evidence of power by application to the Secretary of State.
 Section CLIX. Consular interpreters to be appointed.
 Section CLX. Marshals to be appointed.
 Section CLXI. Constables of consular courts to be appointed.
 Section CLXII. Places at which consular interpreters, marshals, and constables shall be appointed.
 Section CLXIII. The term of appointment of consular interpreters, marshals, and constables.
 Section CLXIV. Removal of interpreters, marshals, &c.
 Section CLXV. Duties of marshals and constables of consular courts.
 Section CLXVI. May appoint messengers, &c.
 Section CLXVII. Regulations for the government of consular courts to be established.
 Section CLXVIII. Consular officers to make suggestions.
 Section CLXIX. All fines and fees incident to consular courts to be accounted for and remitted to the Secretary of the Treasury.
 Section CLXX. Consular courts to be courts of record.
 Section CLXXI. A register of citizens of the United States to be kept.
 Section CLXXII. No fee to be charged for enrollment.
 Section CLXXIII. The act as applied to the Turkish dominions.
 Section CLXXIV. Application to Egypt.
 Section CLXXV. Application of judicial powers to the Barbary States.
 Section CLXXVI. The act as applied to Persia.
 Section CLXXVII. Judicial powers in uncivilized countries.
 Section CLXXVIII. Application of judicial powers to other uncivilized countries.
 Section CLXXIX. Superior authority over consular courts.
 Section CLXXX. Consul-general or consul of the highest class to have supervisory powers over consuls in judicial matters.

- Section CLXXXI. Powers of vice-consuls-general and vice-consuls in the award of punishments.
- Section CLXXXII. Persons acting temporarily as consuls to have power.
- Section CLXXXIII. Consuls to co-operate with ministers of the United States.
- Section CLXXXIV. May issue warrants for arrest of citizens of the United States, &c.
- Section CLXXXV. Civil rights.
- Section CLXXXVI. How such jurisdiction shall be exercised.
- Section CLXXXVII. What cases may be decided by consuls alone.
- Section CLXXXVIII. Certain cases decided by consuls sitting alone may be appealed.
- Section CLXXXIX. Assessors to be appointed in cases where legal questions involved.
- Section CXC. Assessors to be appointed in certain civil cases.
- Section CXCI. Evidence to be taken in writing.
- Section CXCI. Ministers may hear appeals.
- Section CXCI. Punishment to be according to the magnitude of the case.
- Section CXCI. Punishment of murder and insurrection.
- Section CXCI. How criminals shall be executed.
- Section CXCI. Arbitration recommended in certain criminal cases.
- Section CXCI. Settlements by mutual agreement recommended in civil cases.
- Section CXCI. Power to send persons charged with crimes for trial to the United States.
- Section CXCI. Power to send convicts for execution or imprisonment to the United States.
- Section CC. Limitations of actions.
- Section CCI. Ministers to have original jurisdiction in cases where consuls interested.
- Section CCII. Appeal from the minister in criminal cases, &c.
- Section CCIII. Appeals from the consuls.
- Section CCIV. When appeals shall begin.
- Section CCV. A police report to be kept.
- Section CCVI. Citizens sent out of the country to be reported.
- Section CCVII. Returns of civil suits to be made.
- Section CCVIII. Powers of ministers the same as before, except in certain cases.
- Section CCIX. Provisions for the payment of expenses incident to the judicial powers of consuls.
- Section CCX. No prisons to be opened except with the sanction of the President.
- Section CCXI. Consuls may call upon the local authorities to assist them.
- Section CCXII. Annual reports to be made of the means of executing sentences.
- Section CCXIII. Marriages in the presence of consular officers in foreign countries valid.

CONCLUSION.

- Section CCXIV. Commencement of this act.

APPENDIX.

- Schedule A. Copies of forms to be used by consular officers of the United States, for the prevention of abuses in the transportation of Chinese passengers in American vessels.
- Schedule B. Returns of civil suits.
- Schedule C. Acts and parts of acts repealed by consular act of 187—.
- Schedule D. Acts or parts of acts not to be repealed.

A BILL

TO ESTABLISH A CONSULAR SERVICE FOR THE UNITED STATES OF AMERICA, AND TO AMEND AND CONSOLIDATE SUNDRY ACTS OF CONGRESS RELATING TO THE POWERS AND DUTIES OF CONSULAR OFFICERS.

PRELIMINARY.

Repealing certain laws, but said repeal not to affect matters pending under the present laws.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the acts and parts of acts hereinafter mentioned shall be, and the same are hereby, repealed, but such repeal shall not be construed to affect or extend to any crimes or offenses heretofore committed, and which are punishable under any law hereby repealed; but all such crimes and offenses shall be prosecuted, determined, and punished according to the said laws, the same as if this act had not passed; nor shall such repeal be construed to affect the appointment of any consular officer or officers connected with the consular service unless the consulate or office be abolished by the provisions of this act, until a successor shall have been appointed in the place of such officer, and shall have arrived at his post and commenced the performance of his official duties; nor shall such repeal be construed to affect any debts or demands under or by virtue of the said laws, but all such debts and demands shall have full force and effect; but no debts or demands incurred after the date of the going into effect of this act shall have any force or effect whatever, except in accordance with the provisions of this act, the repeal as aforesaid to apply to the following acts, or parts of acts, that is to say: Sections two, three, six, and nine of the act entitled "An act concerning consuls and vice-consuls," approved April fourteenth, seventeen hundred and ninety-two; the first, second, third, fourth, seventh, eighth, and ninth sections of the act entitled "An act supplementary to the act concerning consuls and vice-consuls, and for the further protection of American seamen," approved February twenty-eighth, eighteen hundred and three; all of the act entitled "An act in addition to the act entitled 'An act supplementary to the act concerning consuls and vice-consuls, and for the further protection of American seamen,'" approved February twenty-eighth, eighteen hundred and eleven; all of the act entitled "An act to prescribe the punishments of consuls, commercial agents, and others in certain cases," approved March third, eighteen hundred and thirty-five; all of the act entitled "An act in addition to the several acts regulating the shipment and discharge of seamen, and the duties of consuls," approved July twentieth, eighteen hundred and forty, excepting the fifth, sixth, and seventh sections already repealed; all of the act entitled "An act requiring foreign regulations of commerce to be laid annually before Congress," approved August sixteenth, eighteen hundred and forty-two; the second section of the act entitled "An act to amend an act entitled 'An act to provide for the enlistment of boys for the naval service, and to extend the term of enlistment of seamen,'" approved February twentieth, eighteen hundred and forty-five; so much of the sixth section of the act entitled "An act to provide for the transportation of the mail between the United States and foreign countries, and for other purposes," approved March third, eighteen hundred and forty-five, as relates to the payment of certain postages by consular officers; the sixth section of the act entitled "An act to provide for recording the conveyance of vessels, and for other purposes," approved July twenty-ninth, eighteen hundred and fifty; all of the act entitled "An act to amend an act entitled 'An act requiring foreign regulations of commerce to be laid annually before Congress,' approved August sixteenth, eighteen hundred and forty-two, and for other purposes," approved August eighteenth, eighteen hundred and fifty-six; the third, fourth, fifth, sixth, seventh, eighth, and eleventh, and all other sections, excepting the thirty-third, which follow thereafter, of the act entitled "An act to regulate the diplomatic and consular systems of the United States," approved August eighteenth, eighteen hundred and fifty-six, and relate to consular officers; the second and third sections of the act entitled "An act making appropriation for the consular and diplomatic expenses of the Government for the year ending the thirtieth of June,

eighteen hundred and sixty," approved March third, eighteen hundred and fifty-nine; all portions of the act entitled "An act to carry into effect the provisions of the treaties between the United States, China, Japan, Siam, Persia, and other countries, giving certain judicial powers to ministers and consuls, or other functionaries of the United States, in those countries, and for other purposes," approved June twenty-second, eighteen hundred and sixty, as relate to consular officers, courts, marshals, and jails; all of the act entitled "An act to reduce consular fees for vessels running to or between foreign ports," approved August fifth, eighteen hundred and sixty-one; so much of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending thirtieth of June, eighteen hundred and sixty-three, and additional appropriations for the year ending thirtieth of June, eighteen hundred and sixty-two," approved February fourth, eighteen hundred and sixty-two, as relates to the compensation to be allowed to certain consulates therein named; such portion of the act entitled "An act to prohibit the cooly trade by American citizens in American vessels," approved February nineteenth, eighteen hundred and sixty-two, as relates to the duties of consuls, that is to say, portion of section fourth; such portion of the act entitled "An act to authorize the President of the United States to appoint diplomatic representatives to the republics of Hayti and Liberia," approved June fifth, eighteen hundred and sixty-two, as accredits the commissioner of the United States to Hayti, also as consul-general, and as relates to the compensation allowed to the commissioner and consul-general of the United States to Liberia; so much of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June thirtieth, eighteen hundred and sixty-four," approved February fourth, eighteen hundred and sixty-three, as relates to the salary of the consul at Guaymas; so much of the twenty-fourth section of the act entitled "An act making appropriations for sundry civil expenses of the Government for the year ending June thirtieth, eighteen hundred and sixty-four, and for the year ending June thirtieth, eighteen hundred and sixty-three, and for other purposes," approved March third, eighteen hundred and sixty-three, as authorizes the President of the United States to discontinue the consulate of the United States at Trinidad de Cuba, and authorizes the appointment of a consul at Cienfuegos; all of the act entitled "An act to provide for the collection of hospital dues from vessels of the United States sold or transferred in foreign ports or waters," approved April twenty-ninth, eighteen hundred and sixty-four; so much of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending the thirtieth of June, eighteen hundred and sixty-five, and for other purposes," approved June twentieth, eighteen hundred and sixty-four, as fixes the salaries to be paid to certain consulates therein named, and also sections two and four of the said act, and so much of the same act as says, "And the consul-general at Alexandria shall have the name and title of agent and consul-general;" so much of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June thirtieth, eighteen hundred and sixty-seven, and for other purposes," approved July twenty-fifth, eighteen hundred and sixty-six, as fixes the salaries to be paid to certain consulates therein named, also such portions of the third section as relates to the application of consular fees in certain cases; so much of the eleventh section of the act entitled "An act making appropriations for sundry civil expenses of the Government for the year ending June thirtieth, eighteen hundred and sixty-seven, and for other purposes," approved July twenty-eighth, eighteen hundred and sixty-six, as applies to the consulate-general of the United States in Egypt, and to the powers of the agent and consul-general in the said country; so much of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June thirtieth, eighteen hundred and sixty-eight, and for other purposes," approved February twenty-eighth, eighteen hundred and sixty-seven, as fixes the salaries to be paid to certain consulates therein named; so much of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June thirtieth, eighteen hundred and sixty-nine, and for other purposes," approved March thirtieth, eighteen hundred and sixty-eight, as fixes the salaries to be paid to certain consulates named therein, and sections two and three; all of the act entitled "An act authorizing the admission in evidence of

copies of certain papers, documents, and entries," approved January eighth, eighteen hundred and sixty-nine; the second, third, fifth, and sixth sections of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June thirtieth, eighteen hundred and seventy, and for other purposes," approved March third, eighteen hundred and sixty-nine; the whole of the act entitled "An act to amend an act entitled 'An act to carry into effect provisions of the treaties between the United States, China, Japan, Siam, Persia, and other countries, giving certain judicial powers to ministers and consuls, or other functionaries of the United States in those countries, and for other purposes,' approved June twenty-second, eighteen hundred and sixty," approved July first, eighteen hundred and seventy; and so much of the act entitled "An act making appropriations for sundry civil expenses of the Government for the year ending June thirtieth, eighteen hundred and seventy-one, and for other purposes," approved July fifteenth, eighteen hundred and seventy, as fixes the salary of the consul at Port Said, in Egypt; and in every case the repeal herein provided shall be to the extent to which such acts or parts of acts are therein expressed to be repealed, and all such provisions of any other acts of date prior to, during the existence of, or subsequent to, the acts enumerated in this section, and all such laws, customs, instructions, and rules as are inconsistent with the provisions of this act, shall be null and void, and of no effect in changing, altering, or modifying anything hereinafter provided.

Acts in whole or in part relating to the duties of consuls not to be repealed.

SEC. 2. That the following acts or parts of acts, in whole or in part as specified herein, shall remain in full force and effect for the time being; that is to say, the seventh and eighth sections of the act entitled "An act supplementary to and to amend an act to regulate the collection of duties on imports and tonnage, passed second March, seventeen hundred and ninety-nine, and for other purposes," approved March first, eighteen hundred and twenty-three, as subsequently modified or superseded by the first section of the act of March third, eighteen hundred and sixty-three, and the act of March second, eighteen hundred and sixty-seven; the sixteenth section of the act entitled "An act to provide revenue from imports, and to change and modify existing laws imposing duties on imports, and for other purposes," approved August thirtieth, eighteen hundred and forty-two; the first, second, ninth, and tenth sections, and all other parts of the act entitled "An act to regulate the diplomatic and consular systems of the United States," approved August eighteenth, eighteen hundred and fifty-six, as relates to diplomatic representatives of the United States; such portions of the act entitled "An act to carry into effect provisions of the treaties between the United States, China, Japan, Siam, Persia, and other countries, giving certain judicial powers to ministers and consuls, or other functionaries of the United States in those countries, and for other purposes," approved June twenty-second, eighteen hundred and sixty, as relates to diplomatic representatives of the United States, their powers, duties, and privileges, and ministerial courts, except as may be inconsistent with the provisions of this act; the seventeenth, eighteenth, and nineteenth sections of the act entitled "An act increasing temporarily the duties on imports, and for other purposes," approved July fourteenth, eighteen hundred and sixty-two; the act entitled "An act to prevent and punish frauds upon the revenue, to provide for the more certain and speedy collection of claims in favor of the United States, and for other purposes," approved March third, eighteen hundred and sixty-three; the third section of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending the thirtieth of June, eighteen hundred and sixty-five, and for other purposes," approved June twentieth, eighteen hundred and sixty-four, so far as relates to the fee for certifying invoices in certain cases in the British North American provinces; so much of the twenty-seventh section of the act entitled "An act to increase duties on imports, and for other purposes," approved June thirtieth, eighteen hundred and sixty-four, as relates to invoices; the act entitled "An act further to provide for the verification of invoices," approved March third, eighteen hundred and sixty-five; and the act entitled "An act to amend section one of an act to prevent and punish frauds upon the revenue, and for other purposes, approved March third, eighteen hundred and sixty-three," approved July twenty-seventh, eighteen hundred and sixty-eight; and the act entitled "An act to re-organize the marine-hospital service, and to provide for the relief of sick and disabled seamen," approved June twenty-ninth, eighteen hundred and seventy.

SEC. 3. That this act may be cited for all purposes as the "consular act of eighteen hundred and seventy-three." Short title of the act.

SEC. 4. That in the construction and for the purposes of this act, if not inconsistent with the context or subject-matter, the following terms shall have the respective meanings herein assigned to them; that is to say: Interpretation of terms used in this act.

"Consular officer" shall include consul-general, vice-consul-general, consul, and vice-consul, and any person for the time being discharging the duties of consul-general, vice-consul-general, consul, or vice-consul.

"Master" shall include every person, except a pilot, having command or charge of any ship belonging to a citizen of the United States.

"Seaman" shall include every person, except masters and pilots, employed or engaged in any capacity on board any ship.

"Ship" shall include every description of vessel used in navigation, whether propelled by steam or sail, and not propelled by oars.

"American ship" shall be taken to mean any ship carrying the flag and under the jurisdiction of the United States of America.

SEC. 5. That the specification of certain powers and duties in this act, to be exercised or performed by consular officers of the United States of America, shall not be construed to the exclusion of others resulting from the nature of their appointments, or any treaty or convention under which they may act. The powers and duties expressed in this act not to exclude others incident to the appointment or treaty, &c.

SEC. 6. That this act shall not, except as may be hereinafter specially provided, apply to ships belonging to the Government of the United States. Exemption of ships belonging to the U. S.

SEC. 7. That every person who forges or assists in forging, or procures to be forged, such seal or other distinguishing mark as may be adopted and required by the Treasury Department, or who fraudulently alters, assists in fraudulently altering, or procures to be fraudulently altered, any form issued by the Treasury Department, with the view of evading any of the provisions of this act, or any condition contained in such form, shall, for each offense, be deemed guilty of a misdemeanor; and every person who, in any case in which a form sanctioned by the Secretary of the Treasury is by any part of this act required to be used, uses, without reasonable excuse, any form not purporting to be so sanctioned, or who prints, sells, or uses any document purporting to be a form so sanctioned, knowing the same not to be so sanctioned, for the time being, or not to have been prepared and issued by the Secretary of the Treasury, shall, for each such offense, incur a penalty not exceeding fifty dollars. Penalties for forgery of seal and fraudulent alteration of forms, and for not using forms issued by the Treasury Department.

SEC. 8. That this act, for the convenience of the subject-matter treated upon, shall be divided into chapters, as follows: Provisions of this act.

Chapter the first.—Bureau of the Consular Service established: its organization, duties, and powers.

Chapter the second.—Consular service organized, and provisions governing consular salaries, fees, and so forth, and prescribing the general powers and duties of consular officers.

Chapter the third.—The reciprocal duties of consular officers and masters of ships, and for the protection of American seamen from imposition abroad.

Chapter the fourth.—Respecting the verification and authentication of invoices, and the duties of consular officers of the United States therein.

Chapter the fifth.—In relation to the exercise of judicial functions by consular officers of the United States in certain countries.

CHAPTER THE FIRST.

BUREAU OF THE CONSULAR SERVICE ESTABLISHED: ITS ORGANIZATION, DUTIES, AND POWERS.

SEC. 9. That there shall be established in the Treasury Department, at the seat of Government of the United States of America, a bureau, to be known as the Bureau of the Consular Service of the United States of America. Bureau of the Consular Service established.

SEC. 10. That the said Bureau of the Consular Service shall have special jurisdiction, under the supreme direction of the Secretary of the Treasury, over all matters, as hereinafter specified, relating to consular officers and their duties with respect to merchant-ships, masters, and sea- The Bureau of the Consular Service to have charge of all matters not dip.

lomatic, and pertaining to the duties of consular officers.

The principal officer of the Bureau of the Consular Service.

Subordinates of the Bureau of the Consular Service.

Salaries.

Duties of the Superintendent of the Consular Service in regard to this and other acts.

General duties of the Superintendent of the Consular Service.

Seal.

The organization of the Bureau of the Consular Service and duties of its respective branches.

men, and all other duties designated in other acts or growing out of their appointment as commercial representatives of the United States at foreign ports or places.

SEC. 11. That the principal officer of the said Bureau of the Consular Service shall be a person to be known as "the Superintendent of the Consular Service of the United States of America," who shall be appointed by the President, by and with the advice and consent of the Senate, and who may be removed in the same manner.

SEC. 12. That the Superintendent of the Consular Service, for the transaction of the necessary duties of the bureau aforesaid, under his charge, shall be entitled to and may recommend to the Secretary of the Treasury for appointment the following employés, namely: One chief clerk for the Superintendent of the Consular Service; one chief clerk of class four, in charge of the division of consular accounts; one chief clerk of class four, in charge of the division of consular appointments and property; one chief clerk of class four, in charge of the division of seamen; one chief clerk of class four, in charge of the division of invoices; one chief clerk of class four, in charge of the division of judicial powers of consuls, trials and proceedings in consular courts, and the settlement of the estates, in certain cases, of citizens of the United States dying abroad; one chief clerk of class four, in charge of consular archives and commercial statistics; four clerks of class three; one messenger for the Superintendent of the Consular Service, and such a number of temporary clerks and female clerks as may be from time to time required.

SEC. 13. That the annual salaries of the Superintendent of the Consular Service, clerks, and others employed in the Bureau of the Consular Service, shall be as follows:

Of the Superintendent of the Consular Service, five thousand dollars.

Of the chief clerk for the Superintendent of the Consular Service, two thousand dollars.

Of the chief clerks, class four, in charge of divisions of the Bureau of the Consular Service, six in number, each one thousand eight hundred dollars.

Of the clerks of class three, six in number, each one thousand six hundred dollars.

Of the messenger to the Superintendent of the Consular Service, eight hundred and forty dollars.

Of the temporary clerks, according to their class.

SEC. 14. That it shall be the duty of the Superintendent of the Consular Service, and he is hereby authorized, under the direction of the Secretary of the Treasury, to carry into execution the provisions of this act and all other acts in force, for the time being, designating other duties to be performed by consular officers, excepting always such acts or parts of acts investing consular officers, for the time being, with diplomatic functions, and then only shall such exception apply to such portion of their duties as are required by the diplomatic functions so vested in them, but shall in no wise modify, change, or alter their regular duties to the Bureau of the Consular Service in the Treasury Department.

SEC. 15. That the Superintendent of the Consular Service, under the direction and in the name of the Secretary of the Treasury, shall instruct all persons in the consular service of the United States, to the extent necessary, with reference to their duties in all matters pertaining to the provisions of this act, and all other acts or parts of acts imposing duties, excepting diplomatic, for the time being, on consular officers as aforesaid; shall in the same manner prescribe the forms of all official papers; prescribe the manner of keeping and stating accounts; enforce the prompt rendition of returns relative to the said accounts; supervise, according to law, and subject to the settlement of the Auditor and Comptroller, all receipts and expenditures incident to the consular service; prosecute all offenses against the consular laws; order consular courts of inquiry; direct investigations; hear and recommend action on all complaints; and generally superintend the business of the Bureau of the Consular Service, and execute all laws and instructions relative to the consular service.

SEC. 16. That the Superintendent of the Consular Service shall affix the seal of the Treasury Department, in the authentication of all transcripts and copies which may be required from his bureau.

SEC. 17. That in order to facilitate the business which has been generally and shall be, as hereinafter designated, specifically under the supervision of the Bureau of the Consular Service, the said bureau shall be composed of the following divisions, that is to say:

First. The division of accounts, which shall have charge of the

accounts for expenses incident to the consular service, whether defined by law or incidental, in the payment of consular salaries, rent of consular buildings, hospital dues, and consular fees of all kinds, and all other consular accounts not otherwise assigned.

Secondly. The division of consular appointments and property, in which shall be kept a roster, giving the name, place of their official residence, place and date of birth, nationality, if foreign, and every fact or circumstance connected with the personal and official conduct of consular officers, as indicating their fitness, or otherwise, for the position; to have charge of and to keep on file against the name of any officer against whom the same are made, all complaints, from whatever source, to be accessible in case the seriousness of their nature, or for any other sufficient reason, they should demand an investigation; to keep a record of all consular property, seals, flags, arms, presses, books, blanks, stationery, furniture, and so forth, at each consulate of the United States, as hereinafter provided, and to hold the consular officer in whose possession any public property may be, responsible for the same, until relieved by the receipt of his successor for the same, or by satisfactory evidence of destruction by wear or accident.

Thirdly. The division of seamen, to have charge of all disbursements and receipts on account of relief of destitute American seamen, and of all other matters relating to seamen and prescribed by this act.

Fourthly. The division of invoices, to have charge of all instructions and other matters, excepting accounts of fees, relating to invoices.

Fifthly. The division of judicial powers of consuls, trials, and proceedings in consular courts, and the settlement of estates, in certain cases, of citizens of the United States dying abroad, to have charge of all financial business incident to the provisions of this act in the matters above enumerated, and also the accounts growing out of such estates, and the moneys remitted to the Treasury Department, from such sources, to be refunded to the legal heirs or representatives of the parties.

Sixthly. The division of consular archives and commercial statistics to have the custody of all books and papers forming the archives of the Bureau of the Consular Service, and the care, classification, and editing, under the supervision of the Superintendent of the Consular Service, of all commercial returns of American shipping and other interests, and general reports from consular officers of the United States respecting foreign commerce, trade, industry, and other matters of importance at their respective ports; but the duties herein specified shall not operate to preclude any other duties connected with the consular service which it might be necessary from time to time to assign to each or all of the said divisions.

SEC. 18. That the Superintendent of the Consular Service, under the direction and with the sanction of the Secretary of the Treasury, may, from time to time, as the exigencies of the service may require, prepare forms of the various books, instruments, blanks, and papers required by this act or any other acts imposing additional powers or duties upon the Bureau of the Consular Service, and may, in the manner above stated, from time to time, make such alterations therein as he deems requisite; and it shall be the duty of the Secretary of the Treasury, before finally issuing or altering any such form, to give such public notice thereof as he considers necessary in order to prevent inconvenience; and every such book, instrument, blank, and paper, as aforesaid, shall be in the form sanctioned by the Secretary of the Treasury for the time being, and no such book, instrument, blank, or paper as aforesaid, unless made in such form, shall be admissible in evidence in any civil proceeding on the part of any owner or master of any ship, or in any other matters of dispute; and every such book, instrument, blank, or paper, if made in a form purporting to be a proper form, and to be sealed or marked as aforesaid, shall be taken to be made in the form hereby required, unless the contrary is proved.

The Superintendent of the Consular Service to prepare and issue forms under the direction of the Secretary of the Treasury.

SEC. 19. That it shall be the duty of the Superintendent of the Consular Service to furnish to the collectors or other chief officers of customs, at all ports in the United States, an official list, with the place of official residence of all consular officers of the United States, or any other person for the time being authorized to act in their stead; the said list to be used for reference and to prevent fraud, through the signing of invoices or other consular papers, by persons not authorized thereto; and it shall be the duty of the said collectors or other chief officers of

The Superintendent of the Consular Service to furnish list of consular officers to collectors, &c.

customs to report to the Secretary of the Treasury, under cover to the Superintendent of the Consular Service, the names of all persons so improperly signing the papers aforesaid, together with all information necessary to the discovery and identification of the parties, and their speedy punishment.

Reports to be made by the Superintendent of the Consular Service.

SEC. 20. That the superintendent of the consular service shall make, and he is hereby required to make, the following reports to the Secretary of the Treasury for transmission to Congress at each annual session :

First. A report on the condition of the affairs of his Bureau during the year, with respect to its internal workings and the general condition of the consular service abroad, as it appears on the records and in the accounts of the Bureau.

Secondly. A report of all changes, modifications, or improvements during the year, in the Bureau or the consulates abroad, or in the forms and instructions which may have been deemed advisable, stating such changes and the reasons therefor.

Thirdly. A statement of disbursements during the year on account of salaries, rents, incidental expenses, where allowed ; relief of destitute American seamen ; losses by exchange ; consular courts ; the punishment of crimes committed by American citizens on the high seas, or in ports or places where consular officers have sufficient powers to try and punish such crimes and offenses, and of any other disbursement authorized and made under the supervision of the Consular Bureau ; also all receipts from fees of all kinds, relief dues of seamen, hospital dues, amounts remitted as balances due to the legal heirs or representatives of American citizens dying abroad, and of any other moneys, such as fines, &c., received, stating the source ; also giving a summary of the receipts and expenditures incident to the consular service, with a comparative list showing preceding years, not to exceed five.

Fourthly. A list of all officers belonging to the consular service during the year, and in each case the number of days present and the number of days absent from their consulates, whether with or without leave, also giving the aggregate number of years, months, and days of each officer's active duty, since the date of his commission, and, in the case of each officer, the condition and form of accounts made by him ; whether returns are made promptly ; what reports on commercial or other subjects he has made during the year, and any general information as to efficiency or complaints ; but in no case, except in form to be hereafter defined, shall the nature of such complaints be made in such report, but merely the fact to be stated, and the extent of punishment, if any, inflicted, whether by fine, suspension, reprimand, dismissal, or imprisonment.

Fifthly. A financial report of the business for the year in the consular courts of the United States in countries where such courts are permitted, giving a list of such courts, the officers presiding, and the crimes and misdemeanors tried, and the judgments of a pecuniary nature awarded in each case in such court ; also a list of citizens of the United States dying abroad during the year, and officially reported to the Secretary of the Treasury, and all matters relating to the settlement of estates of citizens of the United States by consular officers.

The Superintendent of the Consular Service to prepare commercial reports to be submitted to the Secretary for transmission to Congress.

SEC. 21. That it shall be the duty of the Superintendent of the Consular Service to compile, in a compendious form, to be transmitted by the Secretary of the Treasury annually to Congress within thirty days after the commencement of each ordinary session, all commercial information communicated to the Secretary of the Treasury during the year, by consular officers of the United States abroad, or contained in the official publications of other governments, and deemed of sufficient importance to be republished for information.

Consular officers to make commercial returns to the Secretary of the Treasury.

SEC. 22. That to enable the Superintendent of the Consular Service to make the report of commercial information to the Secretary of the Treasury, as required by the last above-named section, it shall be, and it is hereby declared to be, the duty of all principal consular officers of the United States, or officers acting as such for the time being, in foreign countries, to procure and transmit to the Secretary of the Treasury, under cover to the Superintendent of the Consular Service, authentic commercial, mercantile, or other information respecting the ports or places at which they reside, of a character and form and at such periods as the Secretary of the Treasury may from time to time specially prescribe ; and it shall be the duty of the Superintendent of the Consular Service to specify in the said annual report to the Secretary of the Treasury the names of any of the said officers who may have failed,

without sufficient reason, to comply with the provisions prescribed in this section.

SEC. 23. That there shall be kept in the Bureau of the Consular Service as aforesaid a record of consular books, forms, seals, arms, flags, presses, and furniture of all kinds, the property of the United States, at each consulate and each principal consular officer, and from him to his successor, and his successors shall be held responsible for said books and other property of the United States as aforesaid, including also the consular property of the United States in his consular district; and for the purposes of the commencement of this portion of this act, it shall further be the duty of the Superintendent of the Consular Service to require of all full and principal consular officers of the United States, upon arriving at their posts, respectively, or of those already resident at the consulate, a full and complete inventory of all property of the United States at their consulate and in their consular district; and in case at any time, including the provisions of the present act, any consulate of the United States shall be abolished, for any reason whatsoever, the said superintendent shall require the full consular officer of the United States nearest to the port or place of the consulate abolished, to take possession of all such property of the United States in whose hands soever he may find it, and in all respects comply with, and he shall be subject to, the rules prescribed for the transfer of consular property of the United States. And it shall be the duty of the Superintendent of the Consular Service, under the direction of the Secretary of the Treasury, to prepare and issue the necessary forms, to be used in accounting for and transferring as aforesaid, as occasion may require, all property of the United States in the consulate, from one principal consular officer to his successor, and any deficiencies not explained in a satisfactory manner shall be charged to the principal officer of the consulate at the time said deficiency was discovered, and the amount of loss thereby sustained by the United States shall be deducted out of the compensation of the said consul, or be collected by force of law as a debt due to the United States.

The Superintendent of the Consular Service to keep a record of books, furniture, &c., in possession of each consular officer.

SEC. 24. That all documents whatever, written by or under the direction of the Superintendent of the Consular Service, and issued by the Secretary of the Treasury, and purporting to be sealed with the seal of the Treasury Department, and signed by the Secretary of the Treasury, or any one authorized to act in the premises in his stead, shall be received in evidence, and shall be deemed to be issued or written by or under the direction of the Secretary of the Treasury, without further proof, unless the contrary be shown; and all documents, purporting to be certificates issued by the Secretary of the Treasury, in pursuance of this act, and to be sealed with the seal of the Treasury Department, or to be signed by the Superintendent of the Consular Service when so authorized, shall be deemed to be such certificates without further proof, unless the contrary be shown.

Certificates and documents purporting to be sealed or signed in a given manner to be received in evidence.

SEC. 25. That, subject to the provisions hereinafter contained, the following application shall be made of all moneys remitted by consular officers to the Treasury Department on account of any services or penalties under the provisions of this act:

Application of moneys and fines paid into the Treasury.

First. All consular fees received, or accounted for, to be carried to the account "for the compensation of consuls."

Secondly. All moneys received, or accounted for, as dues on account of relief of destitute American seamen at foreign ports to be carried to the account "for the relief of destitute American seamen."

Thirdly. All moneys received as fees for judicial services performed by consular officers, or as incident to any consular court, to be carried to an account to be known as "the fund for the maintenance of consular courts and jails," where permitted and required, and for the punishment of crime committed by citizens of the United States.

Fourthly. All moneys received from fines, hereinafter specified, to be carried to a fund to be known as the "fund for the payment of expenses of consular courts of inquiry, general examinations and investigations into the condition of the accounts and affairs of the consular service in foreign countries."

Fifthly. All moneys received from hospital dues collected under the provisions of this act shall be, as hereinafter provided, carried to the credit of the "fund for the relief of sick and disabled American seamen."

And the said accounts shall be kept in the Bureau of the Consular

Service and be under the direct supervision of the Superintendent of the Consular Service.

Consular and naval officers and officers of the customs may inspect documents and crews.

SEC. 26. That every consular officer, and every chief officer of customs of the United States, and every commissioned officer of any of the ships of the Navy of the United States, may, in cases where he has reason to suspect that the provisions of this act, or the laws for the time being relating to merchant seamen and to navigation, are not complied with, exercise the following powers, that is to say :

First. He may require the owner, master, or any of the crew of any American ship to produce any official log-books, or other documents, relating to such crew, or any member thereof, in their respective possession or control.

Secondly. He may require any such master to produce a list of all persons on board his ship, and take copies of such official log-books, or documents, or of any part thereof.

Thirdly. He may muster the crew of any such ship.

Fourthly. He may summon the master to appear and give any explanation concerning such ship or crew, or the said official log-books or documents. And if, upon requisition duly made by any person so authorized in that behalf as aforesaid, any person refuses or neglects to produce any such official log-book or document, as he is hereinbefore required to produce, or to allow the same to be inspected or copied as aforesaid, or impedes any such muster of a crew as aforesaid, or refuses or neglects to give any explanation which he is hereinafter required to give, or knowingly misleads or deceives any person hereinbefore authorized to demand any such explanation, he shall for each such offense incur a penalty not exceeding one hundred dollars.

The President may appoint an inspector.

SEC. 27. That the President of the United States, upon the recommendation of the Secretary of the Treasury, may, from time to time, whenever it may seem expedient so to do, appoint any person, who by previous experience may be suitable, an inspector, whose duty it shall be to report to the Secretary of the Treasury, under cover to the Superintendent of the Consular Service, upon the following matters; that is to say: Whether the provisions of this act, or any regulations made under or by virtue of this act, have been complied with, and upon any other matters relating to ships, seamen, consular and commercial affairs of the United States, not involving diplomatic questions, as may be designated in written instructions to such inspector.

Title and powers of inspector.

SEC. 28. That the inspector, as aforesaid, shall, during the time that he holds his appointment, be considered as an officer of the Bureau of the Consular Service, and shall be known as "the inspector of consulates of the United States." And for the purpose of carrying out the objects of his appointment, and to see that the provisions of this and other acts prescribing certain duties to be performed by consular officers are carried out, he shall have the following powers; that is to say:

First. He may administer oaths to American citizens, if not in conflict with local laws, or may, in lieu of requiring or administering an oath, require every person examined by him to make and subscribe a declaration of the truth of the statements made by him in his examination.

Secondly. He may require and enforce the production of all books, papers, or documents which he considers important for such purpose.

Thirdly. He may make examination into the accounts of such consular officers of the United States as may be designated in his instructions, and into all matters connected with the business of their said offices, and for the purpose of making said examinations shall have authority to administer oaths and take testimony, and shall have access to all the books and papers of all consular offices.

Compensation, &c., of inspector.

SEC. 29. That the inspector appointed as aforesaid shall be paid for his services the same compensation as is hereinafter allowed to consuls of the first class; that is to say: four thousand dollars per annum in addition to his actual necessary expenses, the same to be paid out of the sum appropriated for the compensation of consuls.

Reports of inspector to be submitted to Congress.

SEC. 30. That the President shall communicate to Congress, at the commencement of every December session, the name of the inspector appointed as aforesaid, and the amount paid to him, together with the reports of such inspector.

Penalty for obstructing inspector in the execution of his duty.

SEC. 31. That every person who willfully impedes such inspector, appointed as aforesaid, in the execution of his duty, whether on board any ship or elsewhere, shall incur a penalty not exceeding fifty dollars, the same to be recoverable before any justice of the peace in the United States or consular officer of the United States abroad.

CHAPTER THE SECOND.

CONSULAR SERVICE ORGANIZED, AND PROVISIONS GOVERNING THE PAYMENT OF SALARIES, RETURNS OF FEES, AND SO FORTH, AND PRESCRIBING THE GENERAL DUTIES AND POWERS OF CONSULAR OFFICERS.

SEC. 32. That in the construction of this act, and for the purposes of all other acts and parts of acts which shall remain in force after this act shall take effect, defining any of the powers, declaring any of the rights, prescribing any of the duties, or imposing penalty or punishment for any act of omission or commission of any consul-general, consul, vice-consul-general, or vice-consul, or allowing or enjoining the performance of any act, matter, or thing with or before any such officer, all such acts and parts of acts shall in all these several respects, so far as may be consistent with the subject-matter and context of the same, and with this act and the treaties of the United States, be deemed and taken to include and apply to all consular officers, as though all such officers were specially named therein; and the said official designations in contemplation of all such acts and parts of acts, and of this act, shall be deemed and taken to have the respective meanings hereinafter assigned to them, that is to say:

Construction of terms of this act as applied to consular officers.

First. "Consul-general" and "consul" shall be deemed and taken to denote full, principal, and permanent "consular officers" as distinguished from subordinates and substitutes.

Secondly. "Vice-consuls" and "consular agent" shall be deemed and taken to denote "consular officers" subordinate to such principals, exercising the powers and performing the duties within the limits of their consulates respectively, the former at the same ports or places, and the latter at ports or places different from those at which such principals are located respectively.

Thirdly. "Vice-consuls-general" and "vice-consuls" shall be deemed and taken to denote "consular officers," who shall be substituted temporarily to fill the places of "consuls-general" or "consuls" when they shall be temporarily absent or relieved from duty, and the term "consular officer," as used in this act, shall be deemed and taken to include all such officers as are mentioned in this section, and none others.

SEC. 33. That in the execution of the provisions of this act, and all other acts or parts of acts relating to commerce, revenue from imports, and other matters, in which certain duties, not political nor diplomatic in their nature, are prescribed, and in all matters of accounts, all consular officers and others employed in the consular service of the United States shall be taken to be officers of the Treasury Department of the United States, and under the jurisdiction and authority of the Secretary of the Treasury; but this shall not be construed to release any consular officer from performing any duties which may be required of him by the Secretary of State, and not inconsistent with the provisions of this act.

Consular officers to be taken as officers of the Treasury.

SEC. 34. That the principal officers of the consular service of the United States of America shall, for the time being, and until otherwise provided by act of Congress, consist of twelve consuls-general, four consuls of the first class, twenty-six consuls of the second class, thirty-one consuls of the third class, and eighty-three consuls of the fourth class, who shall be appointed by the President of the United States, by and with the advice and consent of the Senate, and who may be removed in the same manner; and the term of office of the said consuls-general and consuls shall be for and during the term of the President by whom they are appointed, and for as long thereafter as may be necessary to carry out the provisions of this act relating to appointments and to promotions in the consular service, unless sooner removed in the manner hereinbefore provided, but such limitation of the term of office shall not be construed to preclude any person then holding such office from re-appointment, but that the said officers, on the contrary, shall have the preference; and it shall be the general duty of such consuls-general and consuls to execute all the provisions of this act, and all rules or instructions which may, from time to time, be required of them by the Secretary of the Treasury.

Principal officers of the consular service.

General duty of such principal consular officers.

SEC. 35. That the President of the United States, in the same manner as hereinafter provided for the appointment of principal consular officers, may appoint two vice-consuls-general, one to reside at the port or place of official residence of the consul-general of the United States in Japan, and one to reside at the port or place of official residence of the consul-

Two salaried vice-consuls-general to be appointed.

general of the United States in China; and the term of office of the said vice-consuls-general shall be the same as provided for principal consular officers; but at any time, should the judicial powers exercised by the consuls-general aforesaid be taken from one or both of them, then the office of vice-consul-general, at such consulates-general as provided by this section, shall cease forthwith; and it shall be the duty of the said vice-consuls-general to perform such duties as may be assigned to them in the transaction of official business, and in all respects be under the same rules and restrictions as applied to full and principal consular officers.

Salaries of consular officers.

SEC. 36. That the annual salaries of the principal officers, vice-consuls-general, interpreters, marshals, constables, and others of the consular service, shall be as follows:

Two consuls-general, each seven thousand five hundred dollars.

Ten consuls-general, each six thousand dollars.

Four consuls of class one, each four thousand dollars.

Twenty-six consuls of class two, each three thousand dollars.

Thirty-one consuls of class three, each two thousand five hundred dollars.

Eighty-three consuls of class four, each two thousand dollars.

Two vice-consuls-general, each three thousand dollars.

Not to exceed sixteen interpreters, as follows:

Amoy, (China,) Bangkok, (Siam,) Canton, (China,) Chin-Kiang, (China,) Constantinople, (Turkey,) Foo-Chow, (China,) Hiogo and Osaka, (Japan, one,) each five hundred dollars.

Kanagawa, (Japan,) or at the official residence of the consul-general of Japan, one thousand five hundred dollars.

Muscat, (Africa,) and Nagasaki, (Japan,) each five hundred dollars.

Shanghai, (China,) two thousand dollars.

Swatow and Tien-Tsin, (China,) Tripoli, Tangier, and Tunis, (Barbary States,) each five hundred dollars.

Two marshals of consular courts, as follows:

Kanagawa, (Japan,) or the residence of the consul-general in the said country, and Shanghai, (China,) each one thousand dollars.

Constables of consular courts at Amoy, Canton, Chin-Kiang, Foo-Chow, Han-Kow, Swatow, and Tien-Tsin, in China; Hiogo and Osaka, (one,) and Nagasaki, Japan; and Constantinople, Turkey, ten in number, each three hundred dollars.

Jailers and other menials, when allowed, according to the rates usually paid for similar persons in the country in which they reside.

Schedule of consulates.

SEC. 37. That consuls-general, consuls, and vice-consuls-general, be appointed to the ports and places hereinafter specified, and shall be entitled to compensation for their services respectively at the rates per annum attached to the name of the consulate-general, or, if consulates, at the rate per annum allowed to each consulate of the class specified, that is to say:

CONSULATES-GENERAL.

AUSTRIA.

Vienna, six thousand dollars.

BRAZIL.

Rio de Janeiro, six thousand dollars.

BRITISH INDIA.

Calcutta, six thousand dollars.

BRITISH NORTH AMERICA.

Montreal, six thousand dollars.

CHINA.

Shanghai, six thousand dollars.

CUBA, (WEST INDIES, SPANISH.)

Havana, six thousand dollars.

EGYPT.

Cairo, six thousand dollars.

FRANCE.

Paris, seven thousand five hundred dollars.

GERMANY.

Berlin, six thousand dollars.

GREAT BRITAIN.

Liverpool, seven thousand five hundred dollars.

JAPAN.

Kanagawa, (Yokohama,) six thousand dollars.

UNITED STATES OF COLOMBIA.

Panama, six thousand dollars.
Twelve in number.

VICE-CONSULS-GENERAL.

CHINA.

Shanghai, three thousand dollars.

JAPAN.

Kanagawa, or the official residence of the consul-general, three thousand dollars.
Two in number.

CONSULATES OF THE FIRST CLASS.

At an annual salary each of four thousand dollars.

GREAT BRITAIN.

London, Manchester, Melbourne, (Australia,) and Sheffield.
Four in number.

CONSULATES OF THE SECOND CLASS.

At an annual salary each of three thousand dollars.

GREAT BRITAIN.

Belfast, Birmingham, Bradford, Glasgow, Hong-Kong, (China,) Singapore, (British India,) and Tunstall.

RUSSIA.

Saint Petersburg.

CONSULAR AGENTS.

GERMANY.

Hamburg.

FRANCE.

Havre and Lyons.

HAWAIIAN ISLANDS.

Honolulu.

PERU.

Callao.

CHINA.

Amoy, Canton, Chin-Kiang, Han-Kow, Foo-Chow, Swatow, and Tien-Tsin.

JAPAN.

Nagasaki and Hiogo and Osaka, (one.)

SIAM.

Bangkok.

BARBARY STATES.

Tangier, Tripoli, and Tunis.
Twenty-six in number.

CONSULATES OF THE THIRD CLASS.

At an annual salary each of two thousand five hundred dollars.

GREAT BRITAIN.

Bombay, (India,) Cardiff, Coaticook, Dundee, Fort Erie, Hamilton (Canada,) Huddersfield and Leith and Edinburgh, (one,) Saint John (New Brunswick,) and Toronto.

GERMANY.

Aix-la-Chapelle, Crefeld, Bremen, Carlsruhe, Chemnitz, Dresden,

Frankfort-on-the-Main, Leipsic, Nuremburg, and Sonneberg.

FRANCE.

Bordeaux and Marseilles.

SPAIN.

Matanzas, (Cuba.)

THE NETHERLANDS.

Batavia, (India.)

BELGIUM.

Antwerp and Brussels.

SWITZERLAND.

Basle and Zurich.

TURKEY.

Constantinople.

ARGENTINE REPUBLIC.

Buenos Ayres.

CHILI.

Valparaiso.
Thirty-one in number.

CONSULATES OF THE FOURTH CLASS.

At an annual salary each of two thousand dollars.

GREAT BRITAIN.

Bay of Islands, Cape Town, Ceylon, (Point de Galle,) Charlottetown, (Prince Edward's Island,) Clifton, Cork and Queenstown, (one,) Demerara, Dublin, Gibraltar, Goderich, Halifax, Kingston, (Jamaica,) Kingston, (Canada,) Malta, Nassau, Newcastle-on-Tyne, Pictou, Port Louis, (Mauritius,) Port Sarnia, Saint Helena, Saint John's, (Quebec,) Seychelles, Sydney, (Australia,) Turk's Island, Victoria, Windsor, and Winnipeg.

GERMANY.

Mayence, Munich, Stettin, and Stuttgart.

RUSSIA.

Odessa.

FRANCE.

Algiers, (Africa,) Calais, Cognac, and Nice.

ITALY.

Florence, Genoa, Leghorn, Messina, Naples, Palermo, and Rome.

SPAIN.

Barcelona, Cadiz, Malaga, San Juan, (Porto Rico,) Santiago de Cuba, and Trinidad de Cuba.

THE NETHERLANDS.

Amsterdam, Curaçoa, and Rotterdam.

AUSTRIA.

Prague and Trieste.

DENMARK.

Copenhagen and Saint Thomas.

SWITZERLAND.

Geneva.

SWEDEN AND NORWAY.

Stockholm.

TURKEY.

Jerusalem and Smyrna.

GREECE.

Piræus.

CONSULAR AGENTS.

PORTUGAL.

Fayal and Lisbon.

MEXICO.

Acapulco, Guaymas, Matamoras, Mazatlan, and Vera Cruz.

UNITED STATES OF COLOMBIA.

Aspinwall.

BRAZIL.

Bahia, Para, and Pernambuco.

HAYTI.

Cape Haytien.

VENEZUELA.

Laguayra.

URUGUAY.

Montevideo.

SAN DOMINGO, (ISLAND.)

San Domingo.

NICARAGUA.

San Juan del Norte and San Juan del Sur, (one.)

CHILL.

Talcahuano.

DOMINIONS OF THE SULTAN OF MUSCAT.

Zanzibar.

FRIENDLY AND NAVIGATOR'S ISLANDS.

Apia.

FEEJEE ISLANDS.

Lanthala.

MADAGASCAR.

Tamatava.

SOCIETY ISLANDS.

Tahiti.

Eighty-three in number.

And all consulates-general and consulates not herein specially continued shall be, and the same are hereby, abolished, to take effect at the date of the commencement of this portion of this act; and all consular officers at consulates so abolished are hereby required forthwith to turn over all property of the United States in their possession to the full and principal consular officer of the United States at the nearest consulate hereby continued, and take receipt therefor, and all such consular officers will receive the same, and in all matters pertaining thereto do and perform all that is or may be required for the security and protection of consular property of the United States; and all full and principal consular officers of the United States, at the time of the commencement of this act, receiving a stated salary and residing at any one of the consulates herein discontinued, shall be, provided they have complied with the provisions of this act respecting consular property, allowed their salary for sixty days after the commencement of this act, and thereafter all such consular officers, without further act or provision, shall cease to be consular officers of the United States, unless previously transferred to consulates continued by this act; and all other consular officers will continue in the performance of their duties until notified to the contrary by the Secretary of the Treasury.

SEC. 38. That such salaries shall be paid to such consuls-general, consuls, and vice-consuls-general, without fee or deduction, except for reasons to be clearly stated by the proper accounting officers of the Treasury of the United States, and shall be held and enjoyed by such consuls-general, consuls, and vice-consuls-general, as aforesaid, so long only as they shall be actually resident at the places at which they may be so appointed to reside, and discharging the duties of such their offices: *Provided, nevertheless,* That the President of the United States, by his approval for that purpose, to be issued through the Secretary of the Treasury, may grant to any such consul-general, consul, or vice-consul-general, as aforesaid, leave of absence from the place to which he may be so appointed as aforesaid, and such consul-general, consul, or vice-consul-general shall be entitled to receive such part only of the whole amount of his salary as hereinafter provided.

Terms on which salaries shall be granted.

SEC. 39. That no consul-general, consul, vice-consul-general, interpreter, marshal, or constable, receiving a fixed salary from the United States, nor shall any consular agent, be absent from his post or the performance of his duties for a longer period than ten days at any one time in any one quarter without a leave of absence previously obtained from the President of the United States; and no consular officer shall receive salary for the time which he may be absent from his post, by leave or otherwise, beyond the term of sixty days in any one year: *Provided,* That the time equal to that usually occupied in going to and from the United States, in case of the return, on leave, of such consular officer to the United States, may be allowed in addition to the said sixty days.

Leaves of absence and salaries.

SEC. 40. That the salaries granted aforesaid shall be taken and received by the said consuls-general, consuls, and vice-consuls-general, in lieu of and as a compensation for all salaries heretofore granted them, or any of them, by previous acts, and all fees of office, official or otherwise, heretofore demanded, received, or taken by them, of or from the masters or commanders of vessels of the United States, or of or from any other person or persons, for or in respect of any duties or services by such consuls-general or consuls done, performed, or rendered for or to any such masters or commanders, or other person or persons aforesaid; and that no such consuls-general, consuls, or vice-consuls-general as aforesaid shall, from and after the day of , eighteen hundred and seventy-three, be entitled for or by reason of, or on account of, any act, matter, or thing by him done or performed in the execution of such his office, or for or on account of any service by him rendered to any masters or commanders of ships or vessels of the United States, or to any other person or persons, in the execution of such his office, to ask, demand, have, receive, or take any fees, recompense, gratuity, compensation, or reward, or any sum or sums of money, save as hereinafter prescribed.

Salaries to be in lieu of salaries and fees formerly paid.

SEC. 41. That no consul-general, consul, or vice-consul-general herein embraced in the list of consuls-general, vice-consuls-general, and consuls of the first, second, third, and fourth classes, shall, while he holds his office, be interested in or transact any business as a merchant, factor, or other trader, or as a clerk or other agent for any such person, to, from, or within the port, place, or limits of his consulate, directly or indirectly, either in his own name or in the name or through the agency of any other person; and if appointed after this act shall take effect he shall, in his official bond, stipulate, as a condition thereof, not to violate this prohibition; and if appointed before, and retained in office after, this act shall take effect, he shall, within such reasonable time as the President of the United States shall prescribe, enter into a new official bond, with such stipulation as a condition thereof; and if any such consul-general, consul, or vice-consul-general shall violate such prohibition, he shall be liable to a penalty therefor for the use of the United States equal in amount to the annual compensation allowed to him as consul-general, consul, or vice-consul-general, which may be recovered in an action of debt at the suit of the United States, either directly for the penalty as such, against such consul-general, consul, or vice-consul-general, or upon his official bond, as liquidate damages, for the breach of such condition, against such consul-general, consul, or vice-consul-general, and his sureties, or any one or more of them; and in every such case all such actions shall be open to the United States for the collection of such penalty till the same be collected in some one of such actions; and every such penalty, when collected, shall be paid into the Treasury of the United States, and be carried to the fund as hereinbefore designated for fines, and such

Salaried consular officers not to transact business.

prohibition shall be applicable to all consuls-general, consuls, and vice-consuls-general receiving a stipulated salary from the United States, unless otherwise expressly provided by law.

Compensation
to be in full.

SEC. 42. That the compensation provided by this act shall be in full for all the services and personal expenses which shall be rendered or incurred by the officers or persons, respectively, for whom such compensation is provided, of whatever nature or kind such services or personal expenses may be, or by whatever treaty, law, or instructions such services or personal expenses so rendered or incurred are or shall be required; and no allowance, other than such as is provided by this act, shall be made in any case for the outfit or return home of any such officer or person; and no consular officer shall, nor shall any person under any consular officer, make any charge, or receive, directly or indirectly, any compensation, by way of commission or otherwise, for receiving or disbursing the wages to which any seaman of the United States shall be entitled, who shall be discharged in any foreign port or place, or for any money advanced to any such seaman who shall seek relief from any consulate of the United States; nor shall any consular officer, or any person under any consular officer, be interested, directly or indirectly, in any profit derived from clothing, boarding, or otherwise supplying or sending home any such seaman: *Provided*, That such prohibition as to profit shall not be construed to relieve or prevent any such officer, who shall be the owner or otherwise interested in any American vessel, from transporting in such ship any such seaman, or from receiving or being interested in such reasonable allowance as may be made for such transportation under the provisions of this or any other act or acts.

Allowance to be
made for rent of
consular offices
and expenses.

SEC. 43. That, in addition to the salaries hereinbefore granted to consuls-general and consuls, there shall be allowed, and each such consular officer is hereby authorized to receive, the sum of twenty per centum of his annual salary, to be expended by him for rent of a suitable office or offices, and for such office-expenses as may be found necessary, to include fuel, lights, cleaning, incidental assistance, and office-messenger, and all other expenses save necessary consular books, stationery, and postage, and the same must, nevertheless, be accounted for according to forms to be prescribed by the Secretary of the Treasury.

Allowance for
clerk-hire.

SEC. 44. That in the place of consular clerks heretofore allowed in certain cases and abolished by the provisions of this act, consular officers of the United States, respectively, who shall receive at their consulates, exclusive of the agencies within their jurisdictions, consular fees in any one year to exceed in the aggregate four thousand dollars, shall be allowed, out of the excess of such fees, the sum of fifteen per centum of such excess, to be expended in clerk-hire, but in no case shall such allowance be less than two hundred and fifty dollars, nor exceed the sum of three thousand five hundred dollars in any one year, at any one consulate; and no expenditures for clerk-hire shall be allowed except upon the written application of the consul-general or consul authorized to receive the same, as provided by this section, and shall give the name or names, place of residence, nationality, previous occupation, and any other information that may be required of him by the Secretary of the Treasury of and relating to the person or persons whom he desires to appoint, and the said application, if satisfactory, shall be granted by the Secretary of the Treasury, and at any time should the fees as herein prescribed be less than four thousand dollars at any of the said consulates, respectively, then without further act the said allowance shall forthwith cease.

The President
may appoint tem-
porary consuls.

SEC. 45. That the President of the United States may, if he shall think the commercial or other interests of the United States, at any port or ports, place or places, not hereinbefore specified, will be thus subserved, appoint, in the same manner as provided for the appointment of other principal consular officers, temporary consuls, who shall receive the compensation allowed to consuls of the fourth class, and shall be held bound by all the provisions of this act the same as permanent principal officers, and the name or names of such temporary consul or consuls shall be reported, together with the reason for such appointment, to Congress within thirty days after the commencement of each ordinary session, but no such appointments shall at any time be made while Congress is in session without previously requesting its approval, and any temporary consul appointed during the recess, and not authorized by Congress upon its first next session, shall cease to fill that office at the close of the said session.

SEC. 46. That all persons desiring appointments as consuls-general, salaried vice-consuls-general, consuls, and marshals, shall, before receiving an appointment in the consular service of the United States, appear, as hereinafter prescribed, before an examining board, to consist of three persons, namely, the Superintendent of the Consular Service, and one person to be designated by the Secretary of State, and one person to be designated by the Secretary of the Treasury; and it shall be the duty of such persons to assemble together at a convenient place in the city of Washington, as occasion may require, and then and there examine into the qualifications of such persons as may be authorized by the President of the United States to come before them for appointment into the said consular service; but such authority shall not be taken or construed to confer such appointment, nor in any case whatever, whether the appointment be made or otherwise, shall any allowance for expenses or compensation be made to such person or persons during the time of such examination, and after such examination of any candidates it shall be the duty of the Superintendent of the Consular Service to report in writing, for himself and the persons associated with him, the result of such examination, and forward the same to the Secretary of State and the Secretary of the Treasury, to be by them approved or disapproved, and the said report upon the qualifications of such candidate or candidates for the said consular service, with the remarks of the Secretaries of State and the Treasury, shall then be presented to the President of the United States for such action as he may see fit to take upon the application and examination of such candidate or candidates.

Certain consular officers, &c., to be examined.

SEC. 47. That in addition to the necessary qualification of candidates, to be determined by examination as hereinbefore prescribed, no person shall be appointed to any consular office unless he shall present sufficient testimonials of good character from at least three responsible persons of the community in which he lives, and shall present the certificate of his parents and minister, or parents and physician, or parents and friends, cognizant of the fact, that he is at least twenty-five years of age and has never shown any indications of unsound mind or decided predilections which would disqualify him for the proper performance and faithful discharge of such official duties as might be required of him.

Personal qualifications and age of candidates.

SEC. 48. That after the commencement of this portion of this act, as hereinafter prescribed, any candidate for place in the consular service of the United States, having passed the necessary examination and received the approval of the President of the United States, shall be nominated, as hereinbefore prescribed, to the office of consul of the fourth class, and shall be prohibited from holding any of the grades above that of fourth class, unless he shall have some time previously served, with good reputation, at least one year in the consular service, or shall have served at least one year in each of the classes below that to which he is appointed. In all cases of promotions of consular officers from one grade to another, the Superintendent of the Consular Service shall prepare, in a compendious form, a statement of the condition of the said officer's accounts, and every other evidence of efficiency and good conduct or otherwise, which may be in the possession of his Bureau, and submit the same to the Secretaries of State and the Treasury, to be used as prescribed for reports of examinations in cases of original appointment.

Consular officers to be promoted.

SEC. 49. That in the beginning of this act at the earliest practicable moment the consular offices hereinbefore provided, after deducting from the whole number of each class, two consuls-general, one consul of the first class, two of the second class, three of the third class, and four of the fourth class, who shall be appointed as hereinbefore and hereinafter prescribed for appointments by the President at large, shall be apportioned among all the States of the Union in fair proportion, and all the consulates so assigned to States shall be apportioned off by lot, or as the Secretaries of State and the Treasury may determine, and anything contained in this act in regard to promotions from grade to grade in the first appointment to the said consular offices shall have no effect, but after such offices shall all have been first filled, then and thereafter the section of this act relating to promotions in the consular service shall have full force and effect, but in no case shall any person appointed under the provisions of this section be excluded from examination as hereinbefore prescribed, and all present consular officers retained in the service shall receive a provisional appointment, and at the earliest practicable or convenient moment, to be determined by the President of the United States, the said officers or any part of them so retained in the consular

Rules to be followed respecting appointments in the beginning of this act.

service, shall be granted leaves of absence to return to the United States, and shall appear before the examining board aforesaid for examination, and if qualified for re-appointment receive a commission, to be issued the same as for Bureau officers of the Treasury Department; but in no case shall any allowance for expenses be made to such officers, nor any compensation except as hereinbefore provided for consular officers on leaves of absence.

Any member of Congress may present candidates for examination.

SEC. 50. That it shall be in the power of any member of Congress to present to the President of the United States the name of any person whom he shall think qualified, to be ordered before the examining board hereinbefore constituted, and such candidate shall be governed in all respects by the provisions of this act and the rules of the said board.

Consular officers not allowed to hold two offices.

SEC. 51. That no consul-general or consul shall be permitted to hold the office or to exercise the duties of consul-general or consul at any other consulate than that for which he is appointed.

Superiors responsible for subordinates.

SEC. 52. That all principal consular officers shall be held responsible officially and pecuniarily for the conduct of the subordinates whom they have recommended or permitted to remain under them, and any neglect to request, stating the reasons, the prompt removal of any such subordinate officer guilty of any violation of this act shall be taken as evidence of the complicity of such principal in such violation of this act, and he, in conjunction with the subordinate, shall be subject to all the pains and penalties as if he alone had committed the offense.

Salaried consular officers must be citizens of the United States.

SEC. 53. That no fixed compensation allowed under the provisions of this act for any consul-general, consul, vice-consul-general, or marshal, or any appropriation therefor, shall be applicable to the payment of the compensation of any person appointed to, or holding any such office after this act shall take effect, who shall not be a citizen of the United States; nor shall any other compensation be allowed in any such case; the provisions of this section, however, shall not apply to the payment of such portions of the salary of the principal officer to his substitute, as prescribed, during the temporary absence of such principal; and in no case shall a person be appointed to any subordinate office whatever in the consular service of the United States when a citizen of the United States can be found to perform the duties with equal ability and at the same rate of compensation.

Fees to go to unclassified consular officers.

SEC. 54. That consular officers not classified as hereinbefore specified, and who do not reside at the place of a full consulate, shall be entitled, as compensation for their services, to such fees as they may collect in pursuance of the provisions of this act, but such compensation shall not exceed one thousand dollars in any one year, and all fees received in excess of that amount must be paid into the Treasury of the United States, and it shall be the duty of the consul-general or superior consular officer within whose jurisdiction the said consular agency is situated, to report upon the desirability at any time of placing the said consular agency on the classified list of salaried consulates; and in no case shall any such unsalaried and unclassified consular officer, as long as he shall remain such, have the rank, title, or name of consul-general or consul, but he shall be designated and known by the title or name of vice-consul or consular agent of the United States.

Compensation of subordinate consular officers.

SEC. 55. That every vice-consul-general, excepting such two as hereinbefore excepted, and vice-consul, shall be entitled, as compensation for his services as such, to the whole or so much of the compensation of the principal consular officer, in whose place he shall be appointed, as shall be determined by the President of the United States, and the residue, if any, shall be paid to such principal consular officer; and every vice-consul not residing at the place of a full consulate and every consular agent shall be entitled, as compensation for his services, to such fees as he may collect in pursuance of the provisions of this act, to the amount of one thousand dollars, and the balance shall be remitted to the principal consular officer of the consulate within the limits of which such vice-consul or consular agent shall be appointed, to be accounted for and paid in full and without detention of any part thereof by the said principal consular officer, any previous law or rule to the contrary notwithstanding, into the Treasury of the United States; and it shall also be the duty of the said vice-consul or consular agent to send directly to the Secretary of the Treasury and the superior consul-general each a copy of the account of such excess of fees remitted to the principal; and the President shall have the power to subject any vice-consul-general, vice-consul, or consular agent, to the prohibition as to engaging in

trade as hereinbefore provided for principal consular officers, and may require from any of them such bond as is provided for the said principal consular officers, whenever he shall think the public interest will be promoted thereby.

SEC. 56. That there shall be no change of rank or compensation of consular officers, except as may be so authorized by Congress.

No change of rank or compensation except by act of Congress.

SEC. 57. That no person appointed after this act shall take effect, to any such office as is hereinbefore mentioned, shall be entitled to compensation for his services therein, except from the time when he shall reach his post and enter upon his official duties to the time when he shall cease to hold such office, and for such time as he shall be actually and necessarily occupied in receiving his instructions, not to exceed thirty days, and in making the transit between the place of his residence, when appointed, and his post of duty, and vice versa, respectively, at the commencement and termination of the period of his official service, for which he shall, in all cases, be allowed and paid as hereinbefore prescribed; and no person shall be deemed to hold any such office after his successor shall be appointed and actually enter upon the duties of his office at his post of duty nor after his official residence at such post shall have terminated if not so relieved; but no such allowance or payment shall be made to any consular officer not paid a fixed salary for the time so occupied in receiving instructions, or in such transit as aforesaid; nor shall any consular officer receiving a fixed salary be allowed compensation for the time so occupied in such transit at the termination of the period of his official service if he shall have resigned or been recalled therefrom for any malfeasance in office.

Commencement of duties.

SEC. 58. That for such time as any consular officer shall be authorized, pursuant to the provisions of any acts relating to that subject, to perform diplomatic functions, in the absence of the regular diplomatic officer in the country to which he shall be appointed, he shall be entitled, in addition to his compensation as such consular officer, to receive compensation for his services, while so authorized, at the rate allowed for a secretary of legation in such country; and, for the time being so appointed, shall, in all matters of duty, comply with all the laws, rules, and instructions governing diplomatic officers of the United States; but in no case shall the performance of such special duties interfere with, alter, change, or modify any of the duties of such consular officer under the provisions of this act.

Consular officers temporarily performing diplomatic duties.

SEC. 59. That no consular officer shall exercise diplomatic functions or hold any diplomatic correspondence or relation on the part of the United States in, with, or to the government or the country to which he shall be appointed or any other country or government, when there shall be in such country any officer of the United States authorized to perform diplomatic functions therein, nor in any case, unless expressly authorized by the President of the United States so to do.

Consular officers not to exercise diplomatic functions unless expressly authorized.

SEC. 60. That every consul-general and consul appointed before and retained in office after this act shall take effect, shall, without unnecessary delay, and every such officer, including salaried vice-consul-general, appointed after this act shall take effect, shall, before he receives his commission or enters upon the duties of his office, enter into a bond to the United States, with such sureties, who shall be permanent residents of the United States, as the Secretary of the Treasury shall approve, in a penal sum not less than two thousand nor more than ten thousand dollars, and in such form as the President of the United States shall prescribe, conditioned for the true and faithful accounting for, paying over, and delivering up of all fees, moneys, goods, effects, books, records, papers, and other property which shall come to his hands, or to the hands of any other person to his use, as such consul-general, consul, or vice-consul-general, under any law now or hereafter enacted. And for the true and faithful performance of all other duties now or hereafter lawfully imposed upon him as such consul-general, consul, or vice-consul-general, and in the case of certain consuls-general, consuls, and vice-consuls-general, hereinbefore mentioned, such bond shall contain, by way of further condition, the stipulation required by this act in regard to engaging in business; and all such bonds shall be deposited with the Secretary of the Treasury; and in no case shall the penalty of such bond be less than the annual compensation allowed to the officer entering into such bond; and the President shall be authorized to require a new or additional bond from any such consul-general or consul, in like form and in such penalty, within the limits aforesaid.

Certain consular officers to give bonds.

in amount, as he shall prescribe, whenever, in his opinion, the public good shall require it.

Subordinate unsalaried consular officers may be appointed.

SEC. 61. That the President be, and he is hereby, authorized to provide for the appointment of vice-consuls-general, vice-consuls, and consular agents, within each consular district, in such manner and under such regulations as he shall deem proper; but no compensation shall be allowed for the services of any such vice-consul-general or vice-consul beyond, nor except out of, the allowance made by this act for the principal consular officers in whose place such appointment shall be made, excepting the vice-consuls-general hereinbefore otherwise provided for and resident in Japan and China, and no vice-consul-general, except those as aforesaid, vice-consul or consular agent, shall be appointed otherwise than in such manner and under such regulations as the President shall prescribe, pursuant to the provisions of this act.

Jurisdiction of consuls-general.

SEC. 62. That the President be, and he is hereby, authorized from time to time to define the extent of country to be embraced within any consular-general and consulate; and the superior officer of such consulate-general shall have supervisory jurisdiction, as hereinafter provided, over all consulates and principal consular officers, or officers acting in their stead for the time being, residing within the limits so prescribed.

Jurisdiction of consuls-general, continued; list of consulates-general.

SEC. 63. That for the purpose of carrying into effect the provisions of this act granting consuls-general supervisory jurisdiction over consuls residing within their respective consulates-general, the following shall constitute the general limits of the consulates-general of the United States:

First. Consulate-general of the United States for the British Isles:

Official residence of the consul-general, Liverpool, England.

Jurisdiction, all consulates of the United States in England, Ireland, Scotland, and Wales, and islands adjacent thereto, and under the authority of the Crown of Great Britain.

Secondly. Consulate-general of the United States for the German Empire, Northern Russia, Norway and Sweden, and Denmark:

Official residence of the consul-general, Berlin, Prussia.

Jurisdiction over all consulates of the United States in the German Empire, and in the Russian Empire north of the latitude of Berlin, Germany, and in Norway and Sweden, and Denmark, and any islands adjacent to the coast and under the authority of such governments.

Thirdly. Consulate-general of the United States for France, the Netherlands, Belgium, Spain, Portugal, and Switzerland:

Official residence of the consul-general, Paris, France.

Jurisdiction, all consulates of the United States in France, the Netherlands, Belgium, Spain, Portugal, and Switzerland, including the islands of the Atlantic Ocean and in the Mediterranean Sea adjacent thereto, and subject to the dominion of any of the countries above mentioned, and also Algiers, in Africa.

Fourthly. Consulate-general of the United States for Austria, Italy, Greece, and Turkey:

Official residence of the consul-general, Vienna, Austria.

Jurisdiction, all consulates of the United States in Russia not included in the jurisdiction of the consul-general at Berlin, in Austria, Italy, Greece, and the Turkish dominions in Europe and Asia, and the islands adjacent thereto, part of or subject to the dominion of any of the said countries.

Fifthly. Consulate-general of the United States for Egypt:

Official residence of the agent and consul-general, Cairo, Egypt.

Jurisdiction, all consulates of the United States in Egypt and the islands and countries adjacent thereto and subject to the sovereignty of the Khedive, as permitted by the government of the Porte.

Sixthly. Consulate-general of the United States for British India:

Official residence of the consulate-general, Calcutta, Bengal.

Jurisdiction, all consulates of the United States in Hindostan, Ceylon, Burmah, Malay Peninsula, including Singapore and Siam, Sumatra, Java, and Borneo, and islands adjacent thereto and subject to the dominion of Great Britain or the Netherlands, or any other foreign powers or native ruler.

Seventhly. Consulate-general of the United States for China:

Official residence of the consul-general, Shanghai, China.

Jurisdiction, all the consulates of the United States in China, the island of Formosa, and on any other island or islands adjacent to the main-land of China, and under the dominion of the Emperor of China.

Eighthly. Consulate-general of the United States for Japan :

Official residence of the consul-general, Kanagawa, (Yokohama,) Japan.

Jurisdiction, all the consulates of the United States in the Japan Islands, at Hong-Kong, and on the Philippine Isles.

Ninthly. Consulate-general of the United States for British North America :

Official residence of consul-general, Montreal, province of Quebec.

Jurisdiction, all the consulates of the United States in British North America, including the Dominion of Canada and the islands adjacent thereto, and exclusive of British Columbia and Winnipeg.

Tenthly. Consulate-general of the United States for Brazil and the east coast of South America :

Official residence of the consul-general, Rio de Janeiro, Brazil.

Jurisdiction, all consulates of the United States in Brazil, Uruguay, and the Argentine Confederation, or any other power now or hereafter occupying the east coast of South America, and the islands adjacent to and under the jurisdiction of any such present or other governments.

Eleventhly. Consulate-general of the United States for the West Indies :

Official residence of the consul-general, Havana, Cuba.

Jurisdiction, all consulates of the United States on the islands of Cuba, Porto Rico, San Domingo, Jamaica, the Virgin Isles, the islands known as the Windward Group, French, Dutch, and British Guiana, the remaining islands of the Leeward Group, the Spanish Main, and the east coast of Mexico, and other countries or islands bordering on or lying within the Gulf of Mexico and the Caribbean Sea.

Twelfthly. Consulate-general of the United States for the west coast of Mexico, Central and South America :

Official residence of the consul-general, Panama, United States of Colombia.

Jurisdiction, all the consulates of the United States in Lower California, on the west coast of Mexico, Central and South America, and islands adjacent to and under the jurisdiction of any of the countries occupying the said limits.

The same supervisory powers as allowed to consuls-general shall also be exercised by the consul of the United States at Melbourne, Australia, and shall embrace all consulates of the United States in Australia, Tasmania, and New Zealand, and any of the consulates of the United States not included in the general division aforesaid shall be assigned to such consulate-general or consulate, or shall be permitted to communicate directly with the Treasury Department, as the President of the United States shall see fit to order, or the consular officer highest in rank in isolated places may be charged for the time being with supervisory powers over consulates of the United States in his vicinity.

SEC. 64. That the supervisory powers exercised by consuls-general and consuls, in certain cases, shall extend to matters of receiving all accounts, returns, and reports of consular officers within their jurisdictions respectively, to examine the same, and to transmit them with any remarks of their own to the Secretary of the Treasury; to forward all complaints which may come to their knowledge respecting consular officers within their jurisdictions respectively; they shall recommend any changes or improvements in any branch of the consular duties, and may perform any other supervisory or recommendatory acts not in conflict with the treaties or conventions, if any, of the countries within their jurisdictions respectively, with the United States, or any customs, laws, or usages of the said countries; but in no case shall such consuls-general or consuls leave their posts for the purposes above stated unless specially authorized so to do by order or instruction in writing from the President of the United States.

Extent of supervisory powers.

SEC. 65. That it shall be the duty of the consul-general to report in writing to the Secretary of the Treasury the limits which, in his judgment, should constitute the boundaries of the respective consulates under his supervisory jurisdiction; and the boundaries so prescribed, before taking effect, shall be sanctioned by the President of the United States, and shall so remain in force, unless sufficient reason at any future time should be given, in the manner above stated, to warrant any change; in cases of all consulates not under the supervision of a consul-general or ranking principal consular officer, the extent of country to be embraced in such consulates shall be defined by the President upon the recommendation of the Secretary of the Treasury.

How consular jurisdictions to be settled.

Certain fees allowed to be taken.

SEC. 66. That it shall and may be lawful for all consuls-general and consuls appointed by the President of the United States, by and with the advice and consent of the Senate of the United States, or any other consular officer authorized by this act and resident within the dominions of any sovereign or any foreign state or power at peace with the United States, to charge and receive the several fees particularly mentioned in the tables which may be from time to time prescribed for and in respect or on account of the several matters and things and official acts and deeds particularly mentioned, and to be applied as hereinafter mentioned; and it shall and may be lawful for the President of the United States, by any order or orders to be by him made, by and with the advice and consent of the Congress of the United States, from time to time, as occasion may require, to increase or diminish, or wholly to abolish, all or any of the fees aforesaid, and to establish and authorize the payment of any greater or smaller or new and additional fees or fee, for or in respect of the several matters and things mentioned in the said schedules, or any of them, or for and in respect of any other matters or things or matter or thing, to be by any such consuls-general or consuls done or performed in the execution of such their said offices.

Penalty on consular officers demanding more fees than specified in the schedule, or specified in any order.

SEC. 67. That in case any consul-general or consul appointed by the President of the United States as aforesaid, or any other consular officer permitted by the provisions of this act to collect fees, shall, by himself or by any person authorized thereto in his behalf, ask, demand, receive, take, or accept, for or by reason or on account of any matter or thing by him done or performed in the execution of such his office, or for or on account or under pretense, or by reason of any service or duty by him rendered, done, or performed in such his office for any person or persons whomsoever, any other or greater fee than is mentioned and specified in the schedule of fees, or than shall be sanctioned and specified in or by any such order or orders as aforesaid, the person or persons so offending shall forfeit and become liable to pay to the Government any sum not exceeding the amount of the salary of such person for one year, nor less than the twelfth part of such annual salary, at the discretion of the court in which such penalty may be recovered; and shall, moreover, for any such offense forfeit such his office and forever after become incapable of serving in the same or the like capacity. And it shall be the duty of all consular officers to give receipts for all fees which shall be collected for their official services respectively, expressing the particular services for which the same were collected, and, if practicable, in case of unlawful charge as aforesaid, the Secretary of the Treasury is hereby authorized to retain, out of the compensation of such consular officer, the amount of such overcharge and of such penalty, and charge the same to such officer, or recover the balance by due process of law, and thereupon to refund such unlawful charge and pay a moiety of such penalty to the person who shall have given the information.

Tables of fees to be exhibited at custom-houses in the United States.

SEC. 68. That a printed copy of the tables of fees allowed by this act, or which may or shall be sanctioned or allowed by subsequent acts, passed upon the recommendation of the President of the United States, shall be exhibited in a conspicuous manner for the inspection of all persons in all custom-houses in the several ports and harbors under the jurisdiction of the United States; and that printed copies thereof shall, by the collector or other chief officer of customs in all such ports and harbors as aforesaid, be delivered gratuitously, and without fee or reward, to every master or commander of any ship and vessel clearing out of any such port or harbor and demanding a copy thereof.

Tables of fees to be exhibited in all consular offices of the United States in foreign countries.

SEC. 69. That a copy of the said schedule or table of fees, or which may be hereafter established and authorized as aforementioned, shall be hung up and exhibited in a conspicuous place in the public offices of all consuls-general and consuls, or other consular officers appointed as aforesaid, in the foreign ports or places to which they may be so appointed, for the inspection of all persons interested therein; and any consul-general, or consul, or other consular officer omitting or neglecting to exhibit any such copy of the said schedules in such public office, or refusing to permit the same to be inspected by any person or persons interested therein, shall, for every such offense, forfeit and pay a sum of money not exceeding one-half the amount of salary, or income from fees if unsalaried, of such person, for one year, nor less than the twelfth part of such annual salary or income, at the discretion of the President of the United States.

SEC. 70. That all fees collected by consuls-general, consuls, vice-consuls-general, and vice-consuls appointed to perform their duties, or by any other person in their behalf, shall be accounted for to the Secretary of the Treasury, and held subject to his draft or other directions, and all such vice-consuls and consular agents as are allowed for their compensation the whole or any part of the fees which they may collect pursuant to the provisions of this act, shall make returns of all such fees as they or any other persons in their behalf shall so collect, in such manner as the Secretary of the Treasury shall prescribe, and a report of the rates or tariff of fees in use, and all such fees as shall be so collected, accounted for, and reported, shall be reported annually to Congress, giving the same in connection with the name of the consulate at which received, and the name of the consular officer by whom received and accounted for; and if any consul-general, consul, or any vice-consul-general, or vice-consul appointed to perform the duty of any such officer, shall omit to collect any fees which he shall be entitled to charge pursuant to the provisions of this act for any official service, he shall be liable to the United States therefor, as though he had collected the same, unless, upon good cause therefor, the Secretary of the Treasury shall think proper to remit the same; and every consular officer shall number all receipts given by him for fees received for official services in the order of their dates, beginning with number one at the commencement of the period of his service, and on the first day of January in every year thereafter during his term of office; and he shall keep a book in which he shall register all fees so received by him, in the order in which they shall be received, specifying in such register each item of service, and the amount received therefor, from whom, and the dates when received, and if for any service connected with any ship or vessel, the name thereof, and indicating what items and amounts are embraced in each receipt given by him therefor, and numbering the same according to the number of the receipts respectively, so that the receipts and register shall correspond with each other; and he shall, in such register, specify the name of the person for whom and the date when he shall grant, issue, or verify any passport, certify any invoice, or perform any other official service in the entry of the receipt of the fees therefor, and also number each consular act so receipted for with the number of such receipt, and as shown by such register; and it shall be the duty of all owners, agents, consignees, masters, and commanders of ships to whom any receipt for fees shall be given by any consular officer to furnish a copy thereof to the collector or chief officer of customs of the district in which such ships shall first arrive on their return to the United States; and it shall be the duty of every such collector or chief officer of customs to forward to the Secretary of the Treasury, under cover to the Superintendent of the Consular Service, all such copies of receipts as shall have been so furnished to him, and also a statement of all certified invoices which shall come to his office, giving the dates of the certificate, and the names of the persons for whom, and of the consular officers by whom, the same were certified; and every consular officer, in rendering his account or report of fees received, shall furnish a full transcript of the register which he is hereby required to keep, under oath or affirmation that the same is true and correct, and that the same contains a full and accurate statement of all fees received by him, or for his use, for his official services as such consular officer, to the best of his knowledge, during the period for which the same shall purport to be rendered, and that such oath or affirmation may be taken before any person having authority to administer oaths and affirmations at the port or place where such consular officer is located; and if any such consular officer shall willfully and corruptly commit perjury in any such oath or affirmation, within the intent and meaning of this or any act of Congress now or hereafter made, he may be charged, proceeded against, fined, and convicted, and dealt with in the same manner in all respects as if such offense had been committed in the United States; and the consular officer or officers so offending shall forfeit and become liable to pay to the Government any sum not exceeding the amount of the salary of such persons for one year, nor less than a fifth part of such annual salary, and be imprisoned not to exceed three years, at the discretion of the court in which such penalty may be recovered, and any consular officer or person convicted for any such offense shall forfeit such his office, and forever after become incapable of serving in the same or the like capacity.

Fees to be accounted for.

Receipts to be given for fees.

Copies of receipts of fees to be furnished to collectors by masters, &c.

Penalty of perjury.

Fees taken by unclassified consular officers to be accounted for.

SEC. 71. That all fees collected by any consular officers of the United States not classified as hereinbefore specified, or any one appointed to perform the duties of their said offices in their behalf, shall be accounted for to the Secretary of the Treasury in the same mode and manner as hereinbefore provided for principal consular officers, and when the fees so collected by any such consular officer amount to more than one thousand dollars in any one year, over and above the expenses of office-rent and clerk-hire, to be approved by the Secretary of the Treasury, of which return shall be made to the Secretary of the Treasury, the excess for that year shall be paid to the principal under whose jurisdiction such consular officer resides, and the said principal officer shall remit the same to the Secretary of the Treasury in the same mode and manner as provided for principal consular officers.

Reducing consular fees on certain vessels.

SEC. 72. That American vessels running regularly by semi-weekly, weekly, or monthly trips, or otherwise, to or between foreign ports, shall not be required to pay fees to consular officers authorized to receive the same for more than four trips in a year, anything in the provisions of this act or other acts respecting consular fees to the contrary notwithstanding.

Fees; how to be collected.

SEC. 73. That all fees collected for and in behalf of the United States in pursuance of this act shall be collected in the coin of the United States, or at its representative value in exchange.

List of returns and accounts to be sent to the Secretary of the Treasury.

SEC. 74. That the following returns and accounts be, and the same are hereby, required to be sent by consuls-general, consuls, and other consular officers so required to do, subject to the pains and penalties hereinbefore or hereinafter prescribed for any delay, to the Secretary of the Treasury, in the manner as hereinbefore prescribed, that is to say:

First. Returns to be sent quarterly from consulates of the United States:

Register of official letters received.

Register of official letters sent.

Record of Treasury fees, with oath or affirmation.

Fees received on account of vessels.

Fees not so received, stating under what heads.

Arrival and departure of American vessels.

List of seamen shipped, discharged, or deceased at the consulate.

Statement under oath of relief to seamen.

Return of dues received on account of fund for the relief of destitute American seamen aboard.

Hospital dues collected.

List of deceased American citizens.

Secondly. Annual returns to be sent from consulates of the United States:

Of names of persons employed at the consulate.

Nationality and amounts paid.

Of furniture and property at the consulate.

Thirdly. Quarterly accounts to be sent from consulates of the United States:

Account-current, to be accompanied by vouchers and certificates.

Salary account, with certificate of non-absence and vouchers, in case of sale of drafts.

Statement of allowances and expenditures for rents, and miscellaneous expenses, on account of consulates and consular duties, with vouchers, and in accordance with the provisions of this act.

Fourthly. Annual reports to be sent from consulates of the United States:

By the consuls-general, giving the general condition of the consular service within their jurisdictions respectively as required by any of the provisions of this act.

By the consuls-general and consuls of commerce, navigation, and industry at the ports or places of their official residence respectively, and on all other matters, and at times and in the form required by the provisions of this act.

And all the returns, accounts, and reports above required shall be forwarded by all consular officers making the same, except as may be otherwise specially ordered by the Secretary of the Treasury, to the consul-general or superior consular officer in whose jurisdiction they reside, and it shall be the duty of such consuls-general or superior consuls to acknowledge the receipt of the same to the principal consular officer from whom received, and shall forward all such returns, accounts, and

reports, with any comments they may wish to make, forthwith to the Secretary of the Treasury.

SEC. 75. That every consular officer of the United States shall keep a detailed list of all seamen shipped and discharged by him, specifying their names and the names of the vessels on or from which they shall be shipped and discharged, respectively, and the payments, if any, made on account of each so discharged, and also of the number of the vessels arrived and departed, and the amounts of their registered tonnage, and the number of their seamen, and of those who are protected, and whether citizens of the United States or not, and, as nearly as possible, the nature and value of their cargoes, and where produced, and make returns of the same, with their accounts and other returns, to the Secretary of the Treasury, as above prescribed.

List of seamen to be kept.

SEC. 76. That all consular books of record, and invoice-books, and accounts, in any consulate of the United States at any foreign port or place, shall be open to free inspection by all persons having business with the consulate, and any consular officer asking any money, gift, or fee for such facilities shall, upon the complaint of any responsible party, be treated with all the penalties provided for neglect to post list of consular fees in a conspicuous place in the consulate, so that it may be examined by all persons.

Consular books, records, &c., to be open to public inspection by persons interested.

SEC. 77. That the Secretary of the Treasury be, and is hereby, authorized to provide, at the public expense, all such stationery, blanks, record and other books, safes, seals, presses, flags, flag-staffs, arms, and books of instruction, as he shall think necessary for the several consulates of the United States in the transaction of their official business; and shall allow consuls-general and consuls who receive a fixed and stated salary an additional sum of twenty per centum, as hereinbefore prescribed, for rent of office or offices, and for all office expenses, and to prescribe such regulations, and make and issue such orders and instructions, not inconsistent with the Constitution or any law of the United States in relation to the duties of all consular officers, the transaction of their business, the rendering of accounts and returns, the payment of salaries, the safe-keeping of the archives and public property in the hands of all such officers, the communication of information, and the procurement and transmission of the products of the arts, sciences, manufactures, agriculture, and commerce, from time to time, as he may think conducive to the public interests; and it shall be the duty of all such officers to conform to such regulations, orders, and instructions; and it shall be the duty of the Secretary of the Treasury to publish official notifications, from time to time, of such, communicated to him by such consular officers, as he may deem important to the public interests, in such newspapers, not to exceed three in number, as he may select, and report to Congress, as hereinbefore prescribed, at least once a year, such information on all subjects which shall be so communicated to him as he may deem valuable for public information.

Blanks, &c., to be furnished.

SEC. 78. That it shall be the duty of every consular officer of the United States to furnish to the Secretary of the Treasury, as often or at such times as shall be required, the prices-current of all articles of merchandise usually exported to the United States from the port or place in which he shall be located.

Prices-current, &c., to be furnished to the Secretary of the Treasury.

SEC. 79. That in case of the sale or transfer of any vessel of the United States in a foreign port or water, the consul-general, consul, vice-consul general, vice-consul, or consular agent of the United States, within whose consulate, district, or consular agency such sale or transfer shall have been made, or in whose hands the papers of such vessels shall be, be, and he is hereby, authorized and required to collect of the master or agent of such vessel all moneys that shall have become due to the United States, under and by virtue of the act entitled "An act for the relief of sick and disabled seamen," approved July sixteenth, seventeen hundred and ninety-eight, and an act entitled "An act to reorganize the marine hospital service, and to provide for the relief of sick and disabled seamen," approved June twenty-ninth, eighteen hundred and seventy, and shall remain unpaid at the time of such sale or transfer; and that any of the consular officers aforesaid be, and they are hereby, instructed and required to retain possession of the papers of such vessel until such moneys shall have been paid as herein provided, and in default of which such sale or transfer shall be void excepting as against the vender; and it shall also be the duty of the consular officers aforesaid, upon the first arrival after the first day of January in each year of any American vessel in any of the ports at which they reside, to examine the accounts of

Collection of hospital dues.

the seamen of the said vessel, and to collect the amount due to the thirty-first day of December of the year last next preceding of unpaid hospital dues required by the act of July twenty-ninth, eighteen hundred and seventy, aforesaid, by the said vessel, since her departure, if within the year aforesaid, from the United States, or for the whole year if she have not touched during that time at any port within the United States and paid the same; and the said consular officer shall give a receipt in form prescribed by the Secretary of the Treasury to the master of the vessel that the said dues had been paid, and it shall be the duty of the said consular officers to account for and remit quarterly to the Secretary of the Treasury the sums so collected by them respectively under the provisions of the said act of eighteen hundred and seventy, to be carried to "the fund for the relief of sick and disabled seamen," and the said returns shall be accompanied with proper vouchers on forms to be furnished by the Secretary of the Treasury; but the provisions of this section, as far as regards settlements with consular officers, shall not apply to American ships making semi-weekly, weekly, or monthly voyages between a port in the United States and a foreign port, except in case of the sale or transfer of such vessel in a foreign port or water.

Oaths may be administered by consuls.

Penalty of perjury.

SEC. 80. That from and after the passage of this act it shall and may be lawful for any and every consul-general, consul, or other consular officer appointed as aforesaid at any foreign port or place, whenever he shall be thereto required, and whenever he shall see necessary, to administer at such foreign port or place any oath, or take any affidavit or affirmation or deposition from any person or persons whomsoever; and also to do and to perform at such foreign port or place all and every notarial acts and act which any notary public could or might be required and is by law empowered to do within the United States; and every such oath, affidavit, affirmation, or deposition, and every such notarial act administered, sworn, affirmed, had, or done by or before such consul-general, consul, or other consular officers and certified under his hand and seal of office, shall be as good, valid, and effectual, and shall be of like force and effect to all intents and purposes as if any such oath, affidavit, or notarial act respectively had been administered, sworn, affirmed, had, or done before any justice of the peace or notary public in any part of the United States, or before any other legal or competent authority of the like nature; and if any person shall willfully and corruptly commit perjury, or by any means procure any person to commit perjury, in any such oath, affirmation, affidavits, or depositions, within the intent and meaning of any acts of Congress now or hereafter made, such offender may be charged, proceeded against, tried, convicted, and dealt with in the same manner, in all respects, as if such offense had been committed in the United States, before any officer duly authorized therein to administer or take such oath, affirmation, affidavit, or deposition, and shall be subject to the same punishment and disability therefor as are or shall be prescribed by any such act for such offense; and any document purporting to have affixed, impressed, or subscribed thereto or thereon the seal and signature of the officer administering or taking the same in testimony thereof shall be admitted in evidence without proof of any such seal or signature being genuine or of the official character of such person, unless the contrary be proved; and if any person shall forge any such seal or signature, or shall tender in evidence any such document with a false or counterfeit seal or signature thereto, knowing the same to be false or counterfeit, he shall be deemed and taken to be guilty of a misdemeanor, and, on conviction, shall be imprisoned not exceeding three years nor less than one year, and fined a sum not to exceed three thousand dollars, and may be charged, proceeded against, fined, convicted, and dealt with therefor in the district where he may be arrested or in custody.

Consular officers may receive protests, declarations, &c.

Copies to be taken as originals.

SEC. 81. That all consular officers of the United States shall have the right in the ports or places to which they are or may be severally appointed, of receiving the protests or declarations which such captains, masters, crews, passengers, and merchants as are citizens of the United States may respectively choose to make there; and also such as any foreigner may choose to make before them, relative to the personal interest of any citizens of the United States. And the copies of the said acts, duly authenticated by the said consuls or vice-consuls, under the seal of their consulates, respectively, shall receive faith in law, equally as their originals would, in all courts of the United States.

SEC. 82. That if any consular officer shall knowingly and falsely certify to any invoice, or other paper to which his certificate is by law authorized or required, he shall, on conviction thereof, in any court of competent jurisdiction, forfeit and pay a fine not exceeding ten thousand dollars, at the discretion of the court, and be imprisoned for a term not exceeding three years, at the like discretion, to forfeit his office, and be forever after incapacitated from holding that or any similar office.

Penalty of false certificates to invoices and other papers.

SEC. 83. That if any consular officer shall falsely and knowingly certify that property belonging to foreigners is property belonging to citizens of the United States, he shall, on conviction thereof, in any court of competent jurisdiction, forfeit and pay a fine not exceeding ten thousand dollars, at the discretion of the court, and be imprisoned for any term not exceeding three years, and forfeit his office, and be forever after disqualified from holding the same or any similar office.

Penalty of false certificate of ownership.

SEC. 84. That if any consular officer shall grant a passport or other paper certifying that any alien, knowing him or her to be such, is a citizen of the United States, he shall, on conviction thereof in any court of competent jurisdiction, forfeit and pay a fine not exceeding one thousand dollars and forfeit such his office, and forever after become incapable of serving in the same or like capacity. Nor shall any consular officer, subject to like penalty for violation of the same, issue or verify any passport or other instrument in the nature of a passport to or for any citizen of the United States, or to or for any person claiming to be or designated as such in such passport or verification, if a diplomatic representative of the United States resides at the same place, unless such representative be absent from such place; and it shall be the duty of all consular officers to perform and carry out all such instructions which they may from time to time receive from the Secretary of State in regard to the granting, issuing, and verification of the passports.

Penalty for illegally issuing passport, &c.

SEC. 85. That all powers of attorney executed after the passage of this act, in a foreign country, for the transfer of any stock of the United States, or for the receipt of interest thereon, shall be verified by the certificate and seal of a consular officer of the United States, if any there be, at the place where the same shall be executed.

Relating to powers of attorney.

SEC. 86. That if any consular officer shall willfully neglect or omit to perform promptly any duty imposed upon him by this or any other act, or by any order or instruction, made or given in pursuance of this or any other act, or shall be guilty of any willful malfeasance or abuse of power, or any corrupt conduct in his office, he shall be liable to all persons injured by any such neglect, or omission, malfeasance, abuse, or corrupt conduct, for all damages occasioned thereby; and for all such damages by any such officer, he and his sureties upon his official bond shall be responsible thereon to the full amount of the penalty thereof, to be sued in the name of the United States for the use of the person or persons so injured: *Provided*, That such suit shall in no case prejudice, but shall be held in entire subordination to the interests, claims, and demands of the United States as against such officer, under such bond, for every willful act of malfeasance or corrupt conduct in his office; and if any such officer shall refuse to pay any draft, order, or warrant which may be drawn upon him by the proper officer of the Treasury Department for any public moneys of the United States in his hands, or for any amount due from him to the United States, whatever the capacity in which he may have received or may hold the same, or to transfer or disburse any such moneys promptly upon the legal requirement of any authorized officer of the United States, he shall be deemed and taken to be guilty of a misdemeanor, and on conviction thereof shall be punished by imprisonment not to exceed ten years nor less than one year, or be fined not to exceed three thousand dollars, nor less than five hundred dollars, or both, at the discretion of the court; and any such officer so offending may be charged, proceeded against, tried, convicted, and dealt with in any district in which he may be arrested or in custody, and also upon conviction for any of the causes or offenses herein mentioned, the said consular officer shall forfeit his office, and forever after become incapable of serving in the same or the like capacity.

Neglect of duty.

SEC. 87. That any consular officer of the United States who shall willfully neglect to render true and just quarterly accounts and returns of the business of his office, and of moneys received by him for the use of the United States, or who shall neglect to pay over any balance of such

Penalty for neglect to render accounts.

moneys which may be due to the United States at the expiration of any quarter, before the expiration of the next succeeding quarter, shall be deemed guilty of embezzlement of the public moneys, and shall, on conviction thereof before any court of the United States having jurisdiction of like offenses, be punished by imprisonment not exceeding one year, and by a fine not exceeding two thousand dollars, and shall be forever disqualified from holding any office of trust or profit in the United States.

Consular courts
of inquiry.

SEC. 88. That where complaints have been made against any bonded consular officer of the United States, and in the judgment of the Secretary of the Treasury the same are of sufficient importance to warrant an investigation, it shall be the duty of the Secretary of the Treasury to direct the Superintendent of the Consular Service to call a consular court of inquiry, and the said court shall sit at the port or place of residence of the consular officer complained against, and shall be composed of the consul-general in whose jurisdiction the consulate is situated, and two principal consular officers nearest at hand; or should any such officers be disqualified for any cause soever, then the composition of the court shall be designated by the Secretary of the Treasury, but always to be composed of disinterested consular officers of the United States residing nearest to the port or place of residence of the consul to be examined; and for the purposes of carrying out the object of their examinations, the officers composing the court shall take oaths and depositions, and have all the powers of a consular inspector and consular officers, as herein provided, over other citizens of the United States.

Penalty for
using the American
flag except
according to law.

SEC. 89. That any consular officer of the United States permitting, under any circumstances whatever, the use of the American flag on any native-built ship, vessel, or boat, engaged in carrying anything for sale or passengers for hire in any of the countries of Asia or Africa or the Turkish dominions, or on any ship, vessel, or boat running in the rivers, seas, or waters of the said countries, for the purpose of evading any treaty, commercial convention, local law, or custom, shall be deemed amenable to the laws of the United States for the punishment of piracy, and may be prosecuted on the complaint of the government of such countries, the minister of the United States, or any officer of the Navy thereof; and it shall be the duty of all officers of the Navy of the United States to demand of the local authorities of the port, if in port, or the nearest local authority if on a river, the seizure of all such ships, vessels, or boats, and if on the high seas then to seize the said ships, vessels, or boats themselves, and report the same, with all the circumstances, to the minister of the country in which such seizure was made, and to the Secretary of the Navy, for transmission to the Secretary of the Treasury; but the provisions herein prescribed shall not apply to small boats belonging to consulates of the United States or citizens of the United States and registered in the consulates of the United States at the port or place, and used for pleasure, or the convenience of personal use, and not within the intent and spirit of this section.

Revision of sec-
tion 4 of the act
prohibiting the
coolie trade.

SEC. 90. That the fourth section of the act entitled "An act to prohibit the coolie trade by American citizens in American vessels," approved February nineteenth, eighteen hundred and sixty-two, shall be so amended that nothing contained in the said act shall be deemed or construed to apply to or affect any free and voluntary emigration of any Chinese subjects, or to any vessel carrying such persons as passengers on board the same; and it shall be the duty of the consular officer of the United States residing at the port from which the vessel may take departure to go on board the said vessel, or otherwise personally satisfy himself that the emigration from such port or place was voluntary, and shall for that purpose see that a list of such passengers be made in accordance with Form one, Schedule A, hereunto appended, giving the number, name in Chinese characters, and translation of name of each such emigrant, and that the emigration is voluntary, and the same shall be verified by the interpreter in the presence of the consular officer, and be certified by the said consular officer according to Form two, Schedule A, hereunto appended; and the said consular officer shall, in order to secure the faithful performance of the requirements of the said act, require of the agent of the vessel, and the captain of the vessel, a compliance with the requirements of Forms three and four, Schedule A, hereunto appended; the consular officer shall then give to the master of the vessel a certificate in accordance with Form five, Schedule A, hereunto appended; and thereafter permit the vessel to depart.

SEC. 91. That it is and shall be the duty of all consular officers of the United States to pay the foreign postage of such letters, destined to the United States, as may be detained at the ports of foreign countries for the non-payment of postage, and to forward the same inclosed to the Superintendent of the Consular Service for transmission to their destination; and in each and every case the amount of postage paid by such consular officer shall be marked on the letter, and the amount thereof shall be collected in the United States, as other postage, on the delivery of the letters, and be repaid to the said consular officer, or be credited on his account in the Bureau of the Consular Service, Treasury Department, but no such amounts shall be paid or credited as aforesaid unless specified in the said consular officer's quarterly accounts for postage, according to the form prescribed by the Secretary of the Treasury for postage of consular officers.

Unpaid letters for the United States at foreign ports to be forwarded to the Superintendent of the Consular Service.

SEC. 92. That the consular officers, whether principal, temporary, substituted, or subordinate, are hereby, either of themselves or by any other person or persons on their behalf, prohibited from entering into any correspondence or communication in regard to the public affairs of any foreign government with any private person, newspaper, or periodical, or otherwise than with the proper officers of the United States, nor shall they recommend any person at home or abroad for any employment of trust or profit under the government of the country in which they officially reside; nor ask nor accept for themselves, or any other person, any present, emolument, pecuniary favor, office, or title of any kind from any such government.

Consular officers not to correspond for newspapers, &c.

SEC. 93. That so much of the act entitled "An act making appropriations for the consular and diplomatic expenses of the Government for the year ending thirtieth June, eighteen hundred and sixty-five, and for other purposes," approved June twentieth, eighteen hundred and sixty-four, which reads, "And the consul-general at Alexandria shall have the name and title of agent and consul-general," shall be so changed as to give the same name and title to the consul-general for Egypt, whose official residence, by the provisions of this act, has been transferred to Cairo, in the said country.

The agent and consul-general in Egypt.

SEC. 94. That it shall be the duty of consular officers of the United States, where the laws of the country permit, to take possession of the personal estates left by any citizen of the United States, other than seamen belonging to any ship or vessel, who shall die within their consulate, leaving there no legal representative, partner in trade, or trustee by him appointed to take care of his effects: they shall inventory the same, with the assistance of two merchants of the United States, or, for want of them, of any others at their choice; shall collect the debts due to the deceased in the country where he died, and pay the debts due from his estate which he shall have there contracted; shall sell at auction, after reasonable notice, such part of the estate as shall be of a perishable nature, and such further part, if any, as shall be necessary for the payment of his debts, and at the expiration of one year from his decease the residue; and the balance of the estate they shall transmit to the Treasury of the United States, to be holden in trust for the legal claimants. But if at any time before such transmission the legal representative of the deceased shall appear and demand his effects in their hands, they shall deliver them up, being paid their fees, and shall cease their proceedings. For the information of the representative of the deceased, it shall be the duty of the consul-general, consul, or vice-consul authorized to proceed as aforesaid in the settlement of his estate, immediately to notify his death in one of the gazettes published in the consulate, and also to the Secretary of the Treasury, that the same may be notified in the State to which the deceased shall belong; and he shall also, as soon as may be, transmit to the Secretary of the Treasury an inventory of the effects of the deceased taken as before directed.

Consular officers to take possession of estates of American citizens other than seamen dying abroad, if the laws permit.

Notification of death; by whom made and how.

SEC. 95. That if any citizen of the United States who shall die abroad shall, by any lawful testamentary disposition, leave special directions for the custody and management by the consular officer of the United States of the port or place where he shall reside of the personal property of which he shall die possessed in such country, and not in violation of any treaty or convention with the United States, or local law, custom, or usage, it shall be the duty of such officer, so far as the law of such country will permit, strictly to observe such directions; and if any such citizen so dying shall, by any lawful testamentary disposition, have appointed any other person or persons than such officer to take charge of

Duties of consular officers in estates of citizens of the United States in certain cases dying abroad.

and manage such property, it shall be the duty of such officer, whenever required by such person or persons so appointed, to give his official aid in whatever way may be necessary to facilitate the proceedings of such person or persons in the lawful execution of such trust, and, so far as the laws of the country permit, to protect the property of the deceased from any interference of the local authorities of the country where such citizen shall die; and to this end it shall be the duty of such consular officer to place his official seal upon all or any of the personal property or effects of the deceased, and to break and remove such seals as may be required by such person or persons, and not otherwise.

Consular officers to execute the laws of the United States relating to crimes of citizens of the United States on the high seas, &c.

SEC. 96. That it is and shall be the duty of consular officers of the United States to execute all laws of the United States which have been or may be hereafter passed for the punishment of crimes committed by citizens of the United States on the high seas, and where allowed at ports or within the limits of foreign countries, and for that purpose shall have all the powers conferred upon other officers to carry out to the fullest extent the objects of such laws.

For the safe custody and conveyance of prisoners to the United States.

SEC. 97. That whenever any complaint shall be made to any consular officer of the United States, of any such offense, or of any offense having been committed at sea by the master and crew, or any or either of them, belonging to any American ship, subject to any of the provisions of this act, or other acts or parts of acts, it shall be lawful for any such consular officer of the United States to inquire into the case, upon oath, and at his discretion to cause any offender to be placed under all necessary restraints, so far as it may be in his power, so that he may be sent and conveyed in safe custody to the United States as soon as practicable, in any vessel of the United States, or of any citizen thereof, to be there proceeded against according to law; and the costs and charges of imprisoning any such offender, and of conveying any of the witnesses to the United States, if not conveyed in the ship to which they respectively belong, shall be considered and deemed as part of the costs of the prosecution, or be paid as costs incurred on account of seafaring citizens of the United States left in distress in foreign parts; and all depositions taken before any consular officer of the United States abroad, and certified under his official seal and signature to be the depositions, and that they were taken in the presence of the party accused, shall be admitted in evidence in all courts having criminal jurisdiction and otherwise, in like manner as depositions taken before any justice of the peace within the United States now are or may be.

As to the conveyance of offenders and witnesses to the United States.

SEC. 98. That it shall be lawful for any consular officer of the United States to order a passage to the United States for any such offender or offenders under necessary restraint, and also for any witnesses; and the master or other person having charge of any ship belonging to any citizen of the United States, bound for the United States, shall, and he is hereby required to, receive and afford a passage and subsistence during the voyage to any such offender or offenders and witnesses, not exceeding the rate of one offender or two witnesses for every one hundred tons of his ship's burden; and shall receive for such offender or offenders and witness or witnesses, for passage, the same compensation as is or shall be allowed by this or any act for the conveyance to the United States of distressed seamen of the United States, to be paid as prescribed for that purpose; and, on his ship's arrival in the United States, the master of any vessel belonging to a citizen of the United States shall take, or cause to be taken, the offender or offenders before a justice of the peace, who shall deal with the matter as in cases of offenses committed upon the high seas; and in case the master or other person having the charge of any ship belonging to any citizen of the United States, when required by the consular officer of the United States to receive and afford a passage to any offender or witness, shall not receive and afford such passage or shall not take or cause to be taken the offender or offenders before a justice of the peace, as aforesaid, every such master shall be liable to a penalty of two hundred and fifty dollars.

Duties of consular officers in cases of stranded vessels.

SEC. 99. That consular officers in cases where ships of the United States shall be stranded on the coasts of their consulates respectively shall, as far as the laws of the country will permit, take proper measures for the purpose of saving the said ships, their cargoes and appurtenances, as for storing and securing the effects and merchandise saved, and for taking an inventory or inventories thereof; and the merchandise and effects saved, with the inventory or inventories thereof taken as aforesaid, shall, after deducting therefrom the expense, be delivered to the

owner or owners: *Provided*, That no consular officer shall have authority to take possession of any such goods, wares, merchandise, or other property when the master, owner, or consignee thereof is present or capable of taking possession of the same.

SEC. 100. That copies of all official papers and documents belonging to and filed or remaining in the office of any consular officer of the United States, and of all official entries in the books or records of any such office, shall, when certified under the hand and official seal of the proper consular officer, be admissible in evidence in all the courts of the United States.

Admission of certain documents, &c., under the consular seal in evidence.

SEC. 101. That the commanding officer of any vessel, squadron, or fleet of the Navy of the United States when upon the high seas, or in any foreign port where there is no resident consul of the United States, shall be, and is hereby, authorized and empowered to exercise all the powers of a consul of the United States in relation to seamen of the United States.

Naval officers of the United States in certain cases may exercise the power of consuls.

CHAPTER THE THIRD.

THE RECIPROCAL DUTIES OF CONSULAR OFFICERS OF THE UNITED STATES AND MASTERS OF AMERICAN SHIPS, AND FOR THE PROTECTION AND RELIEF OF DESTITUTE AMERICAN SEAMEN IN FOREIGN PORTS OR PLACES.

SEC. 102. That from and after the commencement of this act, all acts or parts of acts inconsistent with the provisions of this act for the protection and relief of destitute American seamen at foreign ports or places be, and the same are hereby, repealed, except so far as such acts repeal the acts thereby repealed: *Provided always*, That all offenses which shall have been committed, and all penalties and forfeitures which shall have been incurred, previously to the commencement of this act, shall be punishable and recoverable, respectively, under such acts as if the same had not been repealed: *Provided also*, that all acts and things made, done, or executed under or by virtue of and in accordance with the provisions of the said acts prior to the commencement of this act shall be good, valid, and effectual to all intents and purposes.

Repealing acts inconsistent with this act.

SEC. 103. That all duties relating to seamen imposed by the provisions of this act, and other acts or parts of acts, upon the Superintendent of the Consular Service and consular officers, shall be, and the same are hereby required to be, performed by the said officers in such manner and in such form as shall be or as is prescribed by such acts or parts of acts.

The Superintendent of the Consular Service and consular officers to carry out acts relating to seamen.

SEC. 104. That whenever a ship or vessel belonging to a citizen of the United States shall be sold in a foreign country, and her company discharged, or when a seaman, a citizen of the United States, shall, with his own consent, be discharged in a foreign country, it shall be the duty of the master to produce to the consular office of the United States the list of his ship's company, properly certified, and to pay to such consular officer for every seaman so discharged, being designated on such list as a citizen of the United States, the wages which may then be due to such seamen, the amount thereof to be paid by such consul to each seaman so discharged upon his engagement on board any vessel to return to the United States, or upon his shipment back to the United States, under the provisions of this act, after deducting from the said wages the amount expended for board and lodging and medical attendance, if required, but in no case including amount paid for passage home; and should the said wages not be sufficient to meet the said expenses, then the additional expense shall be paid out of the fund for the relief of destitute American seamen abroad, and each seaman aforesaid shall be relieved as hereinafter prescribed for the relief of destitute seamen; and it shall be the duty of all consular officers of the United States to render account of wages so required and expended and relief afforded, in such form and manner as may be prescribed by the Secretary of the Treasury.

Seamen's wages to be paid when an American ship is sold abroad

SEC. 105. That in lieu of the amounts known as "extra wages," heretofore required to be paid to each seaman, a citizen of the United States, over and above the wages due him by American vessels sold or transferred in a foreign port, or to each and every American seaman, in certain cases specified, discharged in or at a foreign port, the consular general or other consular officer of the United States within whose consulate or consular district any American vessel may enter, be, and

Relief dues to be paid in lieu of extra wages.

he is hereby, authorized and required to collect from the said vessel the amount of one-half of a cent per ton of registered tonnage, the said sums to be entered in a special account to be known as "the fund for the relief of destitute American seamen at foreign ports or places;" and any of the consular officers aforesaid may, and the same are hereby instructed and required to, retain possession of the papers of such vessels until such relief-dues shall have been paid in full, as herein provided; and it shall also be the duty of the said consular officers to examine the papers of the said vessels, and see that the said relief has been paid, and, in default of which, shall examine into the reasons therefor, and report the same, together with all other facts relating thereto, to the Secretary of the Treasury, and the said consular officers shall, and the same are hereby required to, give a receipt for the said relief-dues to the master or other chief officers of the vessel, in form prescribed by the Secretary of the Treasury, that the said dues were paid; and it shall further be the duty of the said consular officers, respectively, to account quarterly to the Secretary of the Treasury for all the sums so received, and to remit quarterly to the Secretary of the Treasury all amounts after deducting one hundred dollars received in excess of the disbursements made and allowed under the provisions of this act; and the said accounts and returns shall, and the same are hereby required to, be accompanied with proper vouchers, in accordance with forms and instructions to be furnished by the Secretary of the Treasury; and in all matters of neglect of duty or other improper conduct, the said consular officers shall be held subject to all the pains and penalties prescribed for the punishment of offenses in matters relating to consular fees, and the relief-dues herein required to be paid must be in the coin of the United States of America, or its equivalent.

Consular officers of the United States to extend relief to American seamen.

Distressed seamen found abroad may be relieved and sent home at the public expense.

SEC. 106. That out of the relief-dues collected as aforesaid, all consular officers of the United States in foreign countries, and in places where there are no such officers, any two resident American merchants, in such manner and under such rules as may be prescribed by the Secretary of the Treasury, may grant to all seamen, citizens of the United States, who have been shipwrecked, discharged, or left behind at any place abroad, whether from any ship employed in the merchant service or from any ships of the United States, or who have been engaged by any person acting either as principal or agent, to serve any ship belonging to any foreign power, or to the subject of any foreign state, and who are in distress in any place abroad, such relief in board, lodging, clothing, and medical attendance as their several necessities may require, until such time as they are able to provide them with a passage home, and for that purpose shall cause such seamen to be put on board some ship belonging to any citizen of the United States bound to any port of the United States, to which they belong, which is in want of men to take up its complement, and in default of any such ship shall provide them with a passage home as soon as possible, in some ship belonging to a citizen of the United States so bound as aforesaid, and shall indorse on the agreement of any ship on board of which any seaman is so taken or sent, the name of every person so sent on board thereof, with such particulars concerning the case as the Secretary of the Treasury requires; and the amount due in respect of such allowance shall be paid, out of any moneys applicable to the relief of distressed American seamen, on the production of the bills of disbursements, with the proper vouchers. It shall be the duty of the said consular officers or merchants to report quarterly, in connection with the account of each seaman so relieved or sent home, a full description, name, place of birth and residence, length of citizenship, vessel on which arrived, when and where shipped, nature of voyage, and so forth, of each seaman so relieved, together with any other facts by which the said seaman may be identified; and if the said information be unsatisfactory, the account for the relief of such seaman not credited shall be, and the same is hereby, required to be disallowed, and the amount expended shall be deducted from the unpaid balance of salary of the consular officer, or be collected by due process of law; and the said consular officers shall, and the same are hereby, required to send a quarterly statement of the arrangements at the port of their residence for the relief of destitute seamen, and all charges for board, lodging, clothing, and medical attendance; and the said statements, and all accounts for relief and receipts of relief-dues, shall be made under oath or affirmation.

SEC. 107. That consular officers of the United States, under such rules as may be prescribed by the Secretary of the Treasury, may grant passage to the United States, in accordance with the provisions of this act, to seamen, citizens of the United States, who may have arrived at their ports, respectively, on any vessel not American, and the same shall be accounted for, as required for other American seamen. Relief of American seamen arriving on other than American vessels.

SEC. 108. That the Secretary of the Treasury, if he deem it necessary or expedient for the protection of the fund for the relief of destitute American seamen, as aforesaid, shall require from all collectors or other chief officers of the customs within the United States, such information as may be required for the purposes in view, from the papers of any American ship entering any port in the United States; and for the further protection of said fund, a sum not to exceed two thousand five hundred dollars in any one year, to be used within the United States, may be expended out of the said fund, under authority from the Secretary of the Treasury for secret service under the direction of the superintendent of the consular service. The Secretary of the Treasury to require information from collectors of customs, and may appoint a secret agent.

SEC. 109. That when any seaman shall complain that the voyage is continued contrary to his agreement, or that he has fulfilled his contract, the consular officer of the United States, or other person authorized thereto, may examine into the same by an inspection of the articles of agreement; and if on the face of them he finds the complaint to be well founded, he shall discharge the seaman if he desires it, and require of the master the payment in full of all the lawful claims of such seaman; and in case the lawful claims of such seaman are not paid upon his discharge, the arrears shall from that time bear an interest of twenty-five per centum, and may be recovered under any law of the United States for the recovery of seamen's wages. Consular officers to see that agreements are complied with.

SEC. 110. That in case any ship belonging to any citizen of the United States be lost, sold, or transferred, an account containing a similar return as required in the several and respective cases before mentioned, made out up to the period of such loss, sale, or transfer, shall, if practicable, be delivered or transmitted by the master or owner at the time of the loss, sale, or transfer, to the collector of the port to which the ship belongs, with all convenient speed; and in case such loss, sale, or transfer shall take place out of the United States, within twelve calendar months at furthest after the loss, sale, or transfer of the ship. Return to be made in case of ship lost or sold abroad.

SEC. 111. That if any master of a ship belonging to any citizen of the United States shall discharge any person belonging to his ship or crew at any foreign port without the previous sanction in writing, to be indorsed on the agreement and crew-list by the consular officer of the United States there, or in his absence, then of two respectable merchants resident there, such master shall be guilty of a misdemeanor; or if any master of any such ship shall abandon or leave behind at any such place abroad, on shore or at sea, any person belonging to his ship or crew, on the plea or pretense of unfitness or inability to proceed on the voyage, or of desertion or disappearance from the ship, without a previous certificate in writing, to be indorsed on the agreement and crew-list, as aforesaid, by the consular officer of the United States there, or in the absence of any such officer, then of two respectable merchants, if there be any such at or within a reasonable distance from the place where the ship shall then be, such master shall be guilty of a misdemeanor; or if any master of any such ship, in case any person belonging to his ship or crew shall desert from the said ship at any place abroad, shall neglect to notify the same in writing to one of such officers as aforesaid, if there be any such resident at or near the place, or in their absence, then to two respectable merchants, as aforesaid, if there be such at or near the place, within twenty-four hours of such desertion, such master shall be guilty of a misdemeanor; and the said officers are hereby authorized and required, and the said merchants are authorized to examine into the grounds of such proposed discharge, or into the plea or pretense of such unfitness, inability, desertion, or disappearance as aforesaid, in a summary way, upon oath, which oath they are hereby respectively authorized to administer, and to grant or refuse such sanction or certificate according to the circumstances, and as it shall appear to them to be just. No seaman to be discharged abroad, nor to be abandoned or left behind, without the sanction of the consul.

SEC. 112. That if any master shall, contrary to the provisions of this act, discharge, abandon, or leave behind any seaman or other person belonging to the ship or crew, with or without his consent, it shall be incumbent on such master or other person, in any indictment or other proceeding against him, to produce the sanction or certificate hereby If any of the crew are left behind, the proof of sanction or authority to be upon the master.

required, or to prove that he had obtained the same previously to having discharged or left behind such seaman, or that it was impracticable for him to obtain such sanction or certificate.

On discharge of seamen abroad, by sale of ship or otherwise, certificates of discharge to be given and seamen to be sent home.

SEC. 113. That whenever any American ship is transferred or disposed of at any place out of the United States, and any seaman belonging thereto does not, in the presence of some consular officer of the United States, or if there is no such consular officer there, in the presence of one or more respectable American merchants residing at the place and not interested in the said ship, signify his consent in writing to complete the voyage if continued, and whenever the service of any seaman belonging to any American ship terminates at any place out of the United States, the master shall give to each such seaman a certificate of discharge in the form sanctioned by the Secretary of the Treasury as aforesaid, and in the case of any certificated mate whose certificate he has retained, shall return such certificate to him, and shall also, besides paying the wages to which such seaman is entitled, pay to the consular officer, or merchant or merchants aforesaid, for each seaman a sum equal to the amount allowed by the provisions of this act for the payment of the passages of seamen, citizens of the United States, to the United States, or in lieu thereof, the said master may provide passage for the seamen aforesaid to the United States; and if the master refuses or neglects to comply with the requirements of this section, any expenses incurred by the consular officer of the United States, or by any other person, on account of such seaman, shall be a charge upon the ship to which such seaman belonged and upon the owner for the time being thereof, and may be recovered against such owners with costs, at the suit of the consular officer or other person defraying such expenses, in the manner in which seamen are enabled to recover wages.

Forcing seamen on shore, &c., a misdemeanor.

SEC. 114. That if the master of any ship belonging to any citizen of the United States, or the mate or other officer of such ship, shall wrongfully force on shore and leave behind, or shall otherwise willfully and wrongfully leave behind, on shore or at sea, in or out of the United States, any person belonging to his ship or crew, before the completion of the voyage for which such person was engaged, or the return of the ship to the United States, such master, mate, or other officer shall be guilty of a misdemeanor; and every misdemeanor mentioned or created by this act shall and may be prosecuted by indictment or other legal proceeding in any court having criminal jurisdiction within the United States; and the offense may be laid and charged in the said indictment or other legal proceeding to have been committed in the place where the offender shall happen to be, who, being convicted thereof, shall be liable to fine or imprisonment, or both, as to the court before whom he is tried shall seem meet; and every court is hereby authorized to issue the necessary legal papers for the examination of any witness or witnesses who may be absent or out of the jurisdiction of the court; and at the trial the depositions so taken, if such witness or witnesses shall be then absent, shall be received in evidence.

Seamen when allowed to be left behind to be paid their wages.

SEC. 115. That every master of an American ship who shall leave any seaman or other person, as aforesaid, on shore at any such port abroad, under a certificate of his not being in a condition to proceed on the voyage, shall deliver to the consular officer of the United States, as the case may be, or if there be none such, to any one or more respectable merchants there, or if there be but one, then to such one merchant, a just and true account of the wages due to such seaman, such account, when delivered to a consular officer, to be in duplicate, and shall pay the same either in money or by a bill drawn upon the owner; and if by bill, then such consular officers or merchants, as aforesaid, are respectively authorized and required, by indorsement on such bill, to certify that the same is drawn for money due on account of seamen's wages, or to that effect, with such further particulars as the Secretary of the Treasury requires; and any master who shall refuse or neglect to deliver a just and true account of such wages, or to pay the amount thereof in money or by bill, as aforesaid, shall, for every such offense or default, forfeit and pay, in addition to the payment of the wages, the sum of fifty dollars; and every master who shall deliver a false account of such wages shall, for every such offense, in addition to the payment of the wages, forfeit and pay the sum of one hundred dollars.

Such wages to be treated as money due to the seamen.

SEC. 116. That every such payment as last aforesaid, whether by bill or money, shall, if made out of the United States, be made to the consular officer of the United States, who shall, if satisfied with the account, indorse on one of the duplicates thereof a receipt for the amount paid

or bill delivered, and shall return the same to the master; and the master shall, within forty-eight hours after his return to his port of destination in the United States, deliver the same to the chief officer of the customs there; and the consular officer shall retain the other duplicate of the said account, and shall, if the seaman subsequently obtains employment at or otherwise quits the port, deduct out of the sum received by him, as aforesaid, any expenses which have been incurred by him in respect of the subsistence of the seaman under the provisions herein contained, and shall pay the remainder to the seaman, and shall also deliver to him an account of the sums so received and expended on his behalf.

SEC. 117. That upon the application of any seaman of the United States for a discharge, if it shall appear to the consular officer of the United States that he is entitled to his discharge under the provisions of this or any other act or acts, or according to the general principles or usages of maritime laws as recognized in the United States, he shall discharge such seaman, and shall require from the master of the ship from which such discharge shall be made the payment of all wages due; and it shall be the duty of such master to pay the same, and no such payment, or any part thereof, shall be remitted in any case except such as are provided for by law, and the wages so required to be paid in coin or its equivalent, any contract or agreement to the contrary notwithstanding; and if any consular officer, when discharging any seaman, shall neglect to require the payment of and collect the wages required to be paid in the case of the discharge of any seaman, he shall be accountable to the United States for the full amount of such wages, to be refunded to such seaman to the full amount; and if any seaman shall, after his discharge, have incurred any expense for board or other necessities, and is unable to pay the same at the port or place of his discharge, before shipping again, such expense shall be paid out of the fund for the relief of destitute American seamen; and to protect the said seamen from imposition, the said consular officers are hereby authorized to retain two-thirds of the wages paid to seamen as aforesaid, and to pay the balance, if any, in full, after complying with the provisions of this act, to the said seamen, respectively, as belongs to them, upon their reshipment on another vessel or shipment to the United States; and moneys so received and expended shall be accounted for in form, to be prescribed by the Secretary of the Treasury, as seamen's wages paid, retained, and refunded.

Discharge of
seamen.

SEC. 118. That it shall be the duty of the consular officers of the United States, from time to time, to provide for the seamen of the United States who may be found destitute within their districts respectively, sufficient subsistence and passages to some port in the United States in the most reasonable manner, at the expense of the United States, subject to such instructions as the Secretary of the Treasury shall give; and that all masters of ships belonging to citizens of the United States, and bound to some port of the same, are hereby required and enjoined to take such seamen on board of their ships at the request of the said consular officers respectively, and to transport them to the port in the United States to which such ships may be bound, on such terms, not exceeding ten dollars for each person, as may be agreed upon between the said master and consular officer. And the said seamen shall, if able, be bound to do duty on board such ships according to their several abilities: *Provided*, That no master of any ship shall be obliged to take a greater number than two men to every one hundred tons burden of the said ship on any one voyage; and if any such master shall refuse the same on the request or order of the consular officer, such master shall forfeit and pay the sum of one hundred dollars for each seaman so refused, to be recovered for the benefit of the United States in any court of competent jurisdiction; and the certificate of any such consular officer, given under his hand and official seal, shall be prima facie evidence of such refusal in any court of law having jurisdiction for the recovery of the penalty aforesaid.

Destitute sea-
men to be sent
home.

SEC. 119. That in all cases where distressed seamen of the United States have been transported from foreign ports where there was no consular officer of the United States, to ports of the United States, and in all cases where they shall hereafter be so transported, there shall be allowed to the master or owner of each vessel in which they shall or may have been transported such reasonable compensation, in addition to the allowance now fixed by law, as shall be deemed equitable by the Secretary of the Treasury.

Reasonable
compensation to
be paid where no
consular officer.

Power for the Government to sue for the amount advanced for the relief of seamen left abroad.

SEC. 120. That if any person shall be discharged, or willfully and wrongfully left behind or abandoned, at any port in or out of the jurisdiction of the United States, by any master, mate, or other officer, contrary to the provisions of this act, and shall become distressed, and be relieved under the provisions of this act or any act hereafter passed for the relief of destitute American seamen, or if any person shall, as principal or agent, engage any citizen of the United States to serve in any vessel belonging to any foreign power, or to the subject of any foreign state, and such last-mentioned person shall become distressed and be relieved as aforesaid, then, in addition to the wages due from such master or owner or person making such engagement, and the penalties to which such master may be liable, the Secretary of the Treasury shall, in the name of the United States, be entitled to sue such master, or the owner of the ship, or any person who shall have made such engagement as aforesaid, at the discretion of the Secretary of the Treasury, for all the charges and expenses which shall have been incurred in or for the subsistence, necessary clothing, and conveyance home, or burial, should he die abroad or before reaching home, of any such seaman or person relieved as aforesaid, as money paid to the use of such master or owner or other person, who shall have made such engagement as aforesaid, and recover the same, together with full costs of the suit, in the same manner as other debts due to the United States are recoverable; and in any proceeding for that purpose proof of the account furnished by any such consular officer of the United States, or by such two merchants, or one merchant, according to the case, shall, together with the proof of payment by the said legal officer of the United States, of the charges incurred on account of any such person, be sufficient evidence that such person was relieved and conveyed home or buried at the expense of the United States; and the court in which any proceeding for the recovery of the said money shall be instituted is hereby authorized to issue the necessary legal documents for the examination of witnesses, and the depositions taken under such legal documents shall be used as evidence.

Masters to seek services of consular officers.

SEC. 121. That it shall be the duty of every master of a ship of the United States, whenever he shall have occasion for any consular or other official service which any consular officer of the United States shall be authorized by law or usage officially to perform, and for which any fees shall be allowed by the rates or tariffs of fees as aforesaid, to apply to such one of the said officers as may then be officially located at the consulate, if any there be, where such service shall be required, to perform such service, and such master shall pay to such officer such fees as shall be allowed for such service in pursuance of the provisions of this act; and if any such master shall omit so to do, he shall be liable to the United States for the amount of the fees lawfully chargeable for such services, as though the said services had been performed by such officers; and all consular officers are hereby authorized and required to retain in their possession all the papers of such ships, which shall be deposited with them as directed by this or any other act, till payment shall be made of all demands and wages on account of such ships.

Duty of a master upon arriving in port to deposit papers with consular officer.

SEC. 122. That it shall also be the duty of every master of a ship belonging to citizens of the United States, who shall sail from any port of the United States at any time after thirty days after the commencement of this act, on his arrival at a foreign port, to deposit his register, sea-letter, and other ship's documents with the consular officer of the United States, if any there be at such port; that in case of refusal or neglect of the said master to deposit the said papers as aforesaid, he shall forfeit and pay five hundred dollars, to be recovered by the said consular officer in his own name, for the benefit of the United States, in any court of competent jurisdiction; and it shall be the duty of such consular officer, on such master producing to him a clearance from the proper officer of the port where his ship may be, to deliver to the said master all of his said papers: *Provided*, That such master shall have complied with the provisions contained in this act.

Ship's agreement on arrival at a foreign port to be deposited with the consul, and at a home port with the collector of customs.

SEC. 123. That if any ship belonging to a citizen of the United States, except steamers and packets in the course of their voyage, shall arrive at any foreign port where there shall be a consular officer of the United States, and remain thereat for forty-eight hours, the master shall, within forty-eight hours of the ship's arrival, deliver, or cause to be delivered, to such consular officer at such foreign port, the agreement or agreements before mentioned, the whole to be kept by such consular officer during the ship's stay in such port, and to be returned to the master a

reasonable time before his departure, with a certificate indorsed on such agreements, respectively, stating when the same were respectively delivered and returned; and in case it shall appear that the required forms or existing laws have been in any respect neglected or transgressed, such consular officer shall make an indorsement to that effect on such agreement, and forthwith transmit a copy of such indorsement to the Secretary of the Treasury, with the fullest information he can collect regarding such neglect or transgression; and if any master shall neglect to deliver any agreement or such account as aforesaid, he shall, for every such neglect or default, forfeit and pay the sum of one hundred dollars; or if any master shall deliver any false or incorrect account, he shall, for every such offense, forfeit and pay the sum of one hundred and fifty dollars.

SEC. 124. That every master of an American vessel who engages any seamen at any place out of the United States, in which there is a consular officer of the United States, shall, before carrying such seamen to sea, procure the sanction of such officer, and shall engage such seamen before such officer; and the same rules as are provided with respect to the engagement of seamen in the United States shall apply to such engagements made before consular officers; and upon every such engagement the consular officer shall indorse upon the agreement his sanction thereof, and an attestation to the effect that the same has been signed in his presence and otherwise made as hereby required; and every master who engages any seaman in any place where there is a consular officer, otherwise than as hereinbefore required, shall incur a penalty not exceeding one hundred dollars; and if in any case the indorsement and attestation hereby required are not made upon the agreement, the burden of proving the engagement to have been made as hereinbefore required shall be upon the master.

Seamen engaged in foreign ports to be shipped with the sanction and in the presence of the consul.

SEC. 125. That whenever any master shall ship a seaman in a foreign port, he shall forthwith take the list of his crew and the duplicate of the shipping-articles to the consul or person who discharges the duties of the office at that port, who shall make the proper entries thereon, setting forth the contract, and describing the person of the seaman, and thereupon the bond originally given for the return of the men shall embrace each person so shipped.

Proceedings in the shipment of a seaman.

SEC. 126. That for the better carrying into effect the purposes of this act it shall be lawful for consular officers of the United States in foreign ports to demand from the master of every ship belonging to a citizen of the United States the production of the log-book, muster-roll of the ship, and such agreements as aforesaid, and a list of passengers and persons on board, and to muster the crew of such ship, and to summon the master to appear before them and give any explanation they may respectively require regarding the said crew, ship, or documents, for the purpose of ascertaining whether the provisions of this act and every other act by which the crews of such ships as aforesaid are regulated, and the laws relating to commerce and navigation, have been kept and complied with, and to take copies of all or any of such documents; and if any such master, on such demand being made, shall refuse to produce such log-book, muster-roll, agreements and list of passengers and persons, or refuse to allow copies to be taken, or shall refuse to permit his crew to be so mustered, or shall refuse to appear and give such explanation as aforesaid, or shall willfully deceive or mislead the person before whom he shall so appear, he shall, for every such neglect, refusal, or offense, forfeit and pay the sum of one hundred dollars.

Consul empowered to require production of the agreement, muster-roll, &c.

SEC. 127. That if any seaman, while on board any ship, states to the master that he desires to make complaint to a consular officer of the United States, against the master or any of the crew, the master shall, if the ship is then at a place where there is any such officer as aforesaid, so soon as the service of the ship will permit, and if the ship is not then at such a place, so soon after her first arrival at such a place as the service of the ship will permit, allow such seaman to go ashore, or send him ashore in proper custody, so that he may be enabled to make such complaint, and shall in default incur a penalty not exceeding fifty dollars.

Seamen to be allowed to go ashore to make complaint to a consular officer.

SEC. 128. That if the officer to whom any such complaint as last aforesaid is made certifies in such statement as aforesaid that there was no reasonable ground for such complaint, each of the parties so complaining shall be liable to forfeit to the owner, out of his wages, a sum not exceeding one week's wages.

Forfeiture for frivolous complaint.

Masters and seamen can make complaints to consuls; and appointment of inspectors.

SEC. 129. That if the first officer, or any officer, and a majority of the crew of any vessel, shall make complaint, in writing, that she is in an unsuitable condition to go to sea, because she is leaky, or insufficiently supplied with sails, rigging, anchors, or any other equipment, or that the crew is insufficient to man her, or that her provisions, stores, and supplies are not, or have not been during the voyage, sufficient and wholesome; thereupon, in any of these or like cases, the consular officer of the United States, or any one who may discharge any duties of such consular officer, shall appoint two disinterested, competent, practical men, acquainted with maritime affairs, to examine into the causes of complaint, who shall, in their report, state what defects and deficiencies, if any, they find to be well founded, as well as what, in their judgment, ought to be done to put the vessel in order for the continuance of her voyage; and the inspectors so appointed shall have full power to examine the vessel and whatever is aboard of her, so far as is pertinent to their inquiry, and also to hear and receive any other proofs which the ends of justice may require; and if, upon a view of the whole proceedings, the consular officer shall be satisfied therewith, he may approve the whole or any part of the report, and shall certify such approval, and if he dissents, shall also certify his reasons for dissenting. The inspectors in their reports shall also state whether, in their opinion, the vessel was sent to sea unsuitably provided in any important or essential particular, by neglect or design, or through mistake or accident; and in case it was by neglect or design, and the consular officer approves of such finding, he shall discharge such of the crew as require it, each of whom shall be entitled, in addition to his wages to the time of discharge, the amount of his passage-money to the United States, as hereinbefore provided, to be retained by the consular officer for that purpose; but if, in the opinion of the inspectors, the defects or deficiencies found to exist have been the result of mistake or accident, and could not, in the exercise of ordinary care, have been known and provided against before the sailing of the vessel, and the master shall, in a reasonable time, remove or remedy the causes of complaint, then the crew shall remain and discharge their duty; otherwise they shall, upon their request, be discharged, and receive their pay up to the time of discharge; and the master shall pay all such reasonable charges in the premises as shall be officially certified to him under the hand of the consular officer; but in case the inspectors report that the complaint is without any good and sufficient cause, the master may retain from the wages of the complainants, in proportion to the pay of each, the amount of such charges, with such reasonable damages for detention on that account as the consular officer directing the inquiry may officially certify.

Consular officers shall enforce laws relating to discipline on American ships.

SEC. 130. That it shall be the duty of any consular officer or shipping-master of the United States to enforce, when the same comes within his jurisdiction, all laws already passed, or which may be passed, relating to the discipline to be observed by masters and seamen on American ships; and all acts of disobedience, insubordination, desertion, or violation of the laws of the United States relating to revenue, are to be investigated and punished as is or may be prescribed by acts respecting such offenses, and notice of the same shall be recorded on the official log-book, and a report of all the circumstances, proceedings, and penalties be made to the Secretary of the Treasury; and in all acts of misconduct for which the agreement imposes a fine, such fine shall be deducted and paid over as follows, that is to say: if the offender is discharged in the United States, the master or owner shall deduct such fine from the wages of the offender, and pay the same over to the chief officer of the customs, to be remitted to the Secretary of the Treasury; and if abroad, the fine, in the presence of the consular officer of the United States, shall be deducted as aforesaid, and an entry of such deduction shall then be made in the official log-book, if any, and signed by such officer, or other person, and on the return of the ship to the United States the master or owner shall pay over such fine, in the case of foreign-going ships, to the officer before whom the crew is discharged; and if any master or owner neglects or refuses to pay over such fine in manner aforesaid, he shall, for each offense, incur a penalty not exceeding six times the amount of the fine retained by him: *Provided*, That no act of misconduct for which any such fine as aforesaid has been inflicted and paid shall be otherwise punished under the provisions of this act.

Consular officers to reclaim deserters.

SEC. 131. That it shall be the duty of consular officers of the United States to reclaim deserters and discountenance insubordination by every means within their power, and where the local authorities can be use-

fully employed for that purpose, to lend their aid and use their exertions to that end in the most effectual manner.

SEC. 132. That in all cases where deserters are apprehended, the consular officer of the United States shall inquire into the facts; and if satisfied that the desertion was caused by unusual or cruel treatment, the seaman shall be discharged, and receive his wages to the time of the discharge, and the officer discharging him shall enter upon the crew-list and shipping-articles the cause of discharge, and the particulars in which the cruelty or unusual treatment consisted, and subscribe his name thereto officially, and the said consular officer shall grant the said seaman or seamen relief in board, lodging, and medical attendance, and if not reshipped on another vessel at the earliest practicable moment, secure passage for and send him or them to the United States, and all expenses incurred on account of the maintenance and passage home of the said seaman or seamen, shall be paid by the consular officer and be charged to the vessel and its owners, and a full account of the same shall be sent forthwith to the Secretary of the Treasury, to be proceeded with as provided for in that portion of this act giving the Secretary of the Treasury power to sue for the amount advanced for the relief of seamen, citizens of the United States, left abroad.

Consular officers to inquire into the cause of desertion.

SEC. 133. That whenever any seaman of any American ship shall desert such ship, the master of such vessel shall note the fact and date of such desertion on the list of the crew, and the same shall be officially authenticated at the consulate of the United States at the port first visited by such vessel after such desertion, if such desertion shall have occurred in a foreign country, or if in such case such vessel shall not visit any place where there be any consulate before her return to the United States, or the desertion shall have occurred in the United States, the fact and time of such desertion shall be officially authenticated before a notary public immediately at the first port where such vessel shall arrive after such desertion; and all wages that may be due to such seaman, and whatever interest he may have in the cargo of such vessel, shall be forfeited to and become the property of the United States, and paid over for their use to the collector of the port where the crew of such vessel are accounted for, as soon as the same can be ascertained, first deducting therefrom any expense which may necessarily have been incurred on account of such vessel in consequence of such desertion; and in settling the account of such wages or interest, no allowance or deduction shall be made except for moneys actually paid, or goods at a fair price supplied, or expenses incurred to or for such seaman, any receipt or voucher from or arrangement with such seaman to the contrary notwithstanding.

Desertions.

SEC. 134. That if any consular officer of the United States shall neglect or omit to perform seasonably the duties hereby imposed upon him respecting American ships, masters, and seamen, or shall be guilty of any malversation or abuse of power, he shall be liable to the injured person for all damages occasioned thereby; and for all malversation and corrupt conduct in office he shall be liable to indictment, and, on conviction by any court of competent jurisdiction, shall be fined not less than one nor more than ten thousand dollars, and be imprisoned not less than one nor more than five years.

Penalty for neglect of duty.

CHAPTER THE FOURTH.

RESPECTING THE VERIFICATION AND AUTHENTICATION OF INVOICES AND THE DUTIES OF CONSULAR OFFICERS OF THE UNITED STATES THEREIN.

SEC. 135. That all acts or parts of acts relating to the verification of invoices and the duties of consular officers of the United States, or other duly-authorized persons therein, inconsistent with the provisions of this act, are hereby repealed, in so much thereof as relates to the acts, deeds, or things herein specially mentioned.

Repeal of acts inconsistent with this portion of this act.

SEC. 136. That in the construction and for the purposes of this act, or other acts or parts of acts relating to invoices of goods imported into the United States, the following terms shall have the respective meanings hereinafter assigned to them, that is to say:

Definition of terms used in this portion of this act.

"Place of shipment" shall mean the place where the goods, wares, or merchandise are manufactured, or where they finally enter the market for sale, as hereinafter prescribed, and begin their journey to the United

States, whether it be at an inland city or other place, or on the seaboard and within the intents and purposes of this act.

"Invoice" shall mean a statement made in accordance with the provisions of this act, and duly declared, verified, and authenticated before a consular officer of the United States, or other person authorized thereto, giving the quantity and value of any goods, wares, or merchandise destined for the United States, and subject to duties of any kind whatever under the laws thereof.

"Verification of an invoice" shall mean the declaration of the manufacturer, or other duly authorized person, as to the quantity, value, and any other matter or information contained in the invoice under the provisions of this act, before a consular officer of the United States, or other person hereinafter authorized to receive the same.

"Authentication of an invoice" shall mean the certificate of the consular officer of the United States, or other herein duly-authorized person, under the consular seal of the United States, if by a consular officer of the United States, done and executed in such manner as prescribed by this act or instructions thereto from the Secretary of the Treasury.

"Consular district" shall mean all such towns, places, or country, under the jurisdiction of one and the same full and principal consular officer of the United States.

And all other terms used in this portion of this act shall have the meaning hereinbefore or hereinafter given them by this act.

Persons declaring to the invoice must be the persons named therein.

SEC. 137. That no consular officer shall certify any invoice, unless he shall be satisfied that the person making the declaration thereto is the person he represents himself to be, that he is a creditable person, and that the statements made are true; and he shall, thereupon, by his certificate, state that he was so satisfied.

Verification to be by declaration only, before a consular officer.

SEC. 138. That for all purposes of the verification of invoices of goods, wares, or merchandise imported into the United States and subject to duty, declaration only, duly signed and authenticated, as hereinafter prescribed, shall be made and executed before a consular officer of the United States, resident at the place of manufacture or other place hereinafter specified, of the said goods, wares, or merchandise, or if there be no such consular officer of the United States resident there, then by a consular officer of a country in amity with the United States who may reside there, or if there be no such consular officer, then by two respectable merchants resident there; and all such declarations must be made as aforesaid before shipment of the said goods, wares, or merchandise, and in the manner hereinafter prescribed; and all shipments before the declaration shall have been made are hereby declared illegal and void; and all consular officers and others herein authorized to verify invoices are required to notify collectors at the ports of destination in the United States of the said goods, wares, or merchandise of the facts, with a view to the seizure of the said goods, wares, or merchandise, for an attempt to defraud the revenue.

Verification to be by declaration and not by oath; and penalty for violation.

SEC. 139. That in all cases, without exception, the verification of invoices aforesaid shall be by declaration of the persons hereinafter mentioned in the manner and form prescribed by this act, and the oath or affirmation, or any oath or affirmation heretofore required, taken or admitted to declaration, whether by the consular officer of the United States or administered or done by or before a duly-authorized magistrate, or other person of the country, shall be, and the same is or are hereby, abolished and required no longer to be taken, and the said declaration, in form to be prescribed by the Secretary of the Treasury, shall be made only before a consular officer of the United States, or other person as herein specially authorized; and the said declaration, duly authenticated by the said consular officer, or other duly-authorized person, and under the consular seal of such consular officer, shall be, and the same is hereby, declared to be, to all intents and purposes, for the benefits of this act, binding and of the same force and effect as an oath or affirmation in the verification of an invoice, and at any time should there appear to the consular officer of the United States, or other duly-authorized person, any doubts as to the correctness of the statements contained in the invoice, the said consular officer or other persons as aforesaid shall, after full investigation, make note thereof on the invoice stating his or their disagreement, and his or their own judgment of the facts so disputed, and all other information which the consular officer or other persons aforesaid may deem necessary for the customs officers of the United States to know; but in no case shall any invoice so disputed be

entirely withheld by the consular officer or other persons as aforesaid from verification, but they may retain the same for any reasonable time, for further inquiry and consideration; and any consular officer of the United States, who may require or permit an oath or affirmation contrary to the provisions of this act, shall be guilty of a misdemeanor, and upon information and satisfactory proof thereof from any person the said consular officer shall, for each offense, be fined twenty-five dollars, the amount to be deducted from his salary, half of which shall go to the informer and the remaining half to the fund for the payment of the expenses of consular courts of inquiry; and all charges of commissioners or other persons for oaths or any other service, and not embraced in the legal fee prescribed under the provisions of this act for the verification and authentication of invoices, are hereby forbidden, and upon the discovery of such illegal fees being required, permitted, or taken, under any circumstances whatever, with or without the said consular officer's consent, the said officer shall be deemed guilty of a misdemeanor, and be subject to a fine of not more than twelve nor less than one month's salary, and dismissal from the consular service of the United States, and be forever after disqualified for a similar office.

SEC. 140. That no verification of invoices of goods, wares, or merchandise imported into the United States shall be valid unless the declaration shall have been made by one at least of the following persons, that is to say: First, by the manufacturer; secondly, by the real owner; thirdly, by the seller; fourthly, by the purchaser. And in case it be found impracticable to secure the declaration of any one of the above-named persons, for reasons stated in writing and satisfactory to the consular officer of the United States or other duly-authorized person, then the agent of any of the persons aforesaid, may declare to the same, having previously filed in the consulate of the United States a duly executed power of attorney from one of the persons aforesaid, authorizing him to act for and binding his principal, and a certified copy of the said power of attorney, for which a consular fee shall be charged and accounted for as such, shall be attached to each invoice, and be forwarded therewith, and under no circumstances shall the shipper, either personally or through his agent or representative, be allowed to make declaration, except he come under the head of one of the above-named persons authorized to do the same.

By whom invoices shall be verified.

SEC. 141. That no declaration to invoice of goods, wares, or merchandise imported into the United States shall be valid unless made before a consular officer of the United States, or other person authorized thereto, at one of the following places, that is to say: First, at the place or in the consular district of manufacturer; secondly, at the place or in the consular district of general store, if the market be actually supplied or the actual sale be made therefrom; thirdly, in countries lying adjacent to and bordering on the United States, at the place or in the consular district nearest to the port or place of clearance for the United States.

Where declarations to invoice shall be made.

SEC. 142. That, in addition to the foregoing provisions for the verification of invoices, the following rules, applicable to special cases, shall also be observed, that is to say:

Explanatory of how, when, and where invoices shall be verified in certain cases.

First, goods, wares, or merchandise, manufactured or bought in one consular district, and ordered by an agent or other person residing in another, shall be invoiced in the district of manufacture.

Secondly, goods, wares, or merchandise manufactured in one consular district, and shipped to another for sale, the said goods shall be invoiced in the consular district where sold, by any one of the persons hereinbefore authorized, but in no case shall this be construed to mean that goods, wares, or merchandise, manufactured in one district and bought by an agent residing in another, shall be invoiced in the district in which the said agent resides, unless the said goods, wares, or merchandise shall have actually been at the place of invoice in the said district and bought there within the terms of this act.

Thirdly, no single invoice shall cover or include goods, wares, or merchandise other than such as were manufactured or bought at the same place, or in the same consular district; and all invoices embracing goods, wares, or merchandise, as aforesaid, manufactured or purchased elsewhere, shall be illegal and void.

Fourthly, no invoice shall embrace goods, wares, or merchandise shipped by two or more vessels.

SEC. 143. That all invoices required by the provisions of this act shall be made out generally in accordance with the following rules, that is to say:

General rules to be observed in all invoices.

First, all invoices shall be in triplicate, and the three copies so required shall be regarded as one invoice, for which a single charge shall be made, as prescribed by the schedule of consular fees for certificate to invoice, including declaration, now, or which may at any future time be, in force under the provisions of this act; and the consular officer aforesaid shall return one of the said triplicates to the person producing them, shall file one for reference and preservation in his office, and shall transmit the remaining one to the collector or the chief officer of the customs at the port of destination, in the United States, of the merchandise, by the master of the vessel in which shipment is made, or by mail; and upon the last-named copy the consular officer aforesaid shall stamp or write upon his consular certificate the amount of the invoice, its consular number, the name of the consulate, the amount and number of the fee received for authentication, and sign in person his own name thereto, and in all other respects, in addition to the above, shall carry out any instructions from the Secretary of the Treasury requiring other information; and for the preservation of the copy retained in the consulate, the said copy shall be folded and indorsed with its number, date, name of the signer of the declaration, shipper, and name of the vessel in which the goods, wares, or merchandise were shipped, and date of sailing of the vessel, if at a sea-port; if not, then the date of starting of the goods on their journey to the United States.

Secondly, the declaration to each and every invoice of the triplicate, when produced to the consular officer of the United States or other person authorized to receive the same, must be signed by one of the persons before mentioned, and must contain the following matter and information:

- (a) That it is in all respects true.
- (b) That no different invoice of the articles therein mentioned has been or will be furnished to any one.
- (c) That it sets forth the actual quantity, respectively, of all articles therein named which are subject to specific duty.
- (d) That upon all articles therein named which are subject, either wholly or in part, to an ad valorem duty, and obtained by purchase, it contains a full and true statement of the time and place of purchase, their actual cost, and all charges upon them in the currency paid therefor, and, when otherwise obtained, the actual market-value thereof, respectively, paid at the time and place at which they were obtained or manufactured.
- (e) That no discounts, bounties, or drawbacks are contained in the said invoice, save such as are actually allowed.

Thirdly, the authentication of an invoice must be by certificate of the consular officer as aforesaid to each one of the said triplicates, under the consular seal, and shall be otherwise marked as may be required by the Secretary of the Treasury, to secure the integrity of the said triplicates, and the said certificate shall contain the following information:

- (a) That the invoice has been produced by the person declaring to the same to the officer certifying the same.
- (b) The date of such production of the invoice.
- (c) The name and identity of the person producing the invoice and signing the declaration.

(d) The intended port of destination of the merchandise in the United States, as declared by such person; and any additional information as may be required by the Secretary of the Treasury in the declaration and authentication of invoices, and shall be so furnished; and the said Secretary shall provide the forms to be used in all matters relating to invoices under the provisions of this act.

Declarations to give the market-value at the time, and no discounts for cash, &c., to be allowed.

SEC. 144. That all declarations to invoices must state and be of the full and actual market-value of the goods, wares, or merchandise at the time and place of making the same, and no discount for cash or decrease or change in the price paid, owing to a fall or rise in the market, shall be allowed.

The currency in which invoices shall be made.

SEC. 145. That all invoices of goods, wares, or merchandise paying a specific duty shall be made out in the currency actually paid therefor, without reference to the currency of the country; or, if paying an ad valorem duty on the market-value, as prescribed in the last before-mentioned section, in the currency and at the place and time of invoice; and where the value of a foreign currency is not fixed by the laws of the United States, or fluctuates, or has been subsequently debased, a consular certificate, in form to be prescribed by the Secretary of the Treas-

ury, shall also be sent, showing the value of the said currency at the time and place of invoice in American silver dollars:

SEC. 146. That it shall be the duty of consular officers of the United States, where practicable, to receive and accept for the use of their consulates, respectively, samples of all goods, wares, and merchandise manufactured at their consulates or in their consular districts, and from these establish certain standards with numbers, or any other designating mark, of a kind which shall be taken to indicate all goods of the said standard of quality; and in the invoices, in lieu of samples, with each of the said invoices the designation of the number or mark aforesaid, corresponding with the standard in the consulate, may answer the purposes in view; and it shall be the duty of each and every consular officer of the United States, requiring samples as aforesaid, to report to the Secretary of the Treasury the course pursued by him with reference to samples. Respecting samples.

SEC. 147. That it shall be the duty of all consular officers of the United States to acquaint themselves with the market-values of all the products and manufactures of their consular districts, and with the currencies, weights, and measures in use in the countries and districts in which they reside, and inform themselves respecting all other matters to the advantage and accuracy of invoices; and the Secretary of the Treasury, at such times as he may see fit, shall test the ability of consular officers in these particulars by requiring of them special reports on the subjects herein referred to; and any consular officer of the United States failing to give satisfactory evidence of his efficiency in this respect shall be removed from office forthwith. Consular officers to keep themselves informed respecting currencies, &c.

CHAPTER THE FIFTH.

IN RELATION TO THE EXERCISE OF JUDICIAL FUNCTIONS BY CONSULAR OFFICERS OF THE UNITED STATES OF AMERICA WITHIN CERTAIN COUNTRIES.

SEC. 148. That it is and shall be lawful for the Government of the United States to hold, exercise, and enjoy any power or jurisdiction which it now has, or may at any time hereafter acquire, by treaty or other lawful means, within any country or place outside of the United States. The power acquired by the United States for its consular officers to exercise judicial powers.

SEC. 149. That every act, matter, and thing which may at any time be done in pursuance of any such power or jurisdiction of the Government of the United States, in any foreign country or place, shall in all courts, and elsewhere under the jurisdiction of the United States, be, and be deemed and adjudged to be, in all cases and to all intents and purposes whatsoever, as valid and effectual as though the same had been done according to the local law then in force within such country or place. Acts done in pursuance of such power to be of the same effect as if done under local laws.

SEC. 150. That in the construction and for the purposes of this portion of this act, if not inconsistent with the context or subject-matter, the following terms shall have the respective meanings hereinafter assigned to them: Definition of terms.

"Minister" shall be understood to mean the person invested with and exercising the principal diplomatic functions in each of the countries mentioned in this portion of this act.

"Consul," in the sense of this portion of this act, shall be understood to mean any person invested by the United States with, and exercising the functions of, consul-general, vice-consul-general, consul or vice-consul in any of the countries herein named.

SEC. 151. That if at any time there be no minister of the United States in either of the countries hereinafter mentioned, the judicial duties which are imposed by this act upon the minister shall devolve upon the consul-general or consul of the United States of the highest class, who is hereby authorized and required to discharge the same. The consul-general to have the powers in certain cases conferred by this act upon ministers.

SEC. 152. That to carry into full effect the provisions of the treaties of the United States with the empires of China and Japan, and Siam, Persia, and Madagascar, respectively, consuls of the United States, duly appointed to reside in each of the said countries, shall, in addition to other powers and duties imposed upon them, respectively, by the provisions of such treaties respectively, be invested with the judicial authority herein described, which shall appertain to the said consuls, and be a part of the duties belonging thereto, wherein the same is allowed by treaty. Consular officers to exercise judicial powers.

No jurisdiction to be exercised beyond the power of the act.

SEC. 153. That no jurisdiction shall be exercised by any consul-general, vice-consul-general, consul, or vice-consul over citizens of the United States beyond the provisions of this act or of acts of Congress hereafter made, and any insufficiency in such acts to meet all requirements of cases arising under the judicial functions of consular officers of the United States in certain countries shall first be reported for the consideration of the Secretary of State.

Powers of consular officers in the premises.

SEC. 154. That in regard to crimes and misdemeanors, the said consuls-general and consuls are hereby fully empowered to arraign and try, in the manner hereinafter provided, all citizens of the United States charged with offenses against law, which shall be committed in such countries respectively, and, upon conviction, to sentence such offenders in the manner herein authorized; and the said consuls-general and consuls, and each of them, are hereby authorized to issue all such processes as are suitable and necessary to carry this authority into execution.

May issue processes.

How proceedings in consular courts shall be held.

SEC. 155. That all proceedings in the consular courts held in virtue of the provisions of this act shall be had, as far as possible, in conformity and correspondence with the proceedings which, in like cases, would be had according to the law and practice in the United States, regard being had to the difference of local circumstances.

Consular judicial officers responsible as such.

SEC. 156. That all consuls-general and consuls aforesaid shall be responsible for their conduct to the United States, and to the laws thereof, not only as consular officers but as judicial officers, when they perform judicial duties, and shall be held liable for all negligences and misconduct as public officers.

Consular officers solely responsible.

SEC. 157. That in all cases which may be heard and determined in the consular courts of the United States under the present act the consular officer is solely responsible; and no directions from the minister of the United States residing in such country will relieve the consular officer from any share of this responsibility.

Courts authorized to procure evidence of power by application to the Secretary of State.

SEC. 158. That if in any suit or other proceedings, whether civil or criminal, in any consular court under the jurisdiction of the United States, any issue or question of law or of fact shall arise, for the due determination whereof it shall, in the opinion of the consular judge or of such court, be necessary to produce evidence of the existence of any such power or jurisdiction as aforesaid, or of the extent thereof, it shall be lawful for the judge of any such court, and he is hereby authorized, to transmit, under his hand and seal, to the Secretary of State, the question or questions by him properly framed, respecting such of the matters aforesaid as it may be necessary to ascertain in order to the due determination of any such issue or question as aforesaid; and the Secretary of State, as the case may be, is hereby empowered and required, within a reasonable time in that behalf, to cause proper and sufficient answers to be returned to all such questions and to be directed to the said judge, or his successors; and such answers shall, upon production thereof, be final and conclusive evidence in such suit or other proceedings, of the several matters therein contained and required to be ascertained thereby.

Consular interpreters to be appointed.

SEC. 159. That the President of the United States, upon the recommendation of the Secretary of State, may appoint interpreters to the consulates of the United States, at the ports or places hereinafter named, if deemed expedient, and the duties of such interpreters shall be such as the principal consular officer may direct in the transaction of the official correspondence and interpretation of the consulate.

Marshals to be appointed.

SEC. 160. That the President of the United States, upon the recommendation of the Secretary of State, may appoint marshals of consular courts, not to exceed two in number, who shall be citizens of the United States, and to be assigned to the consulates of the United States, at the ports hereinafter named, and the duties of such marshals shall be such as are hereinafter prescribed; and the said marshals shall each give bond for the faithful performance of the duties of the office, before entering upon the duties of the same, which bond shall be in a penal sum not to exceed ten thousand dollars, with two sureties to be approved by the Secretary of State, and a certified copy thereof shall be lodged in the office of the minister; and in case any person aggrieved by the misconduct of any of the said marshals should desire to bring suit upon any of the said bonds, it shall be the duty of the Secretary of State, or the minister having custody of a copy of the same, to furnish the person so applying with a certified copy thereof, upon which copy so furnished and certified suit may be brought and prosecuted with the same effect as could be done upon

Marshals to give bonds.

the original: *Provided*, That upon a plea of non est factum, verified upon oath, or any other good cause shown, the court or the consul or minister trying the cause may require the original to be produced; and when so required it shall be the duty of the Secretary of State to forward the original bond to the court or consul or minister requiring the same: *And provided further*, That before a copy of any such bond shall be furnished for suit it shall be the duty of the Secretary of State, or the minister to whom the application is made, to require prima facie proof, to be judged of by the Secretary of State, or the minister having charge of the copy, that there is probable cause of action against the marshal making the bond: *And provided further*, That all rules, orders, writs, and processes of every kind which are intended to operate or be enforced against any of the said marshals in any of the countries hereinafter named shall be directed to, and executed by, such person as may be appointed for that purpose by the minister or consul issuing the same.

SEC. 161. That the Secretary of State, upon the recommendation of the principal consular officer at the port or place where required, may appoint constables of consular courts at the ports or places hereinafter named, and the duties of such constables shall be such as are hereinafter prescribed; but no such appointment shall be made unless the Secretary of State has been advised of all the reasons for such appointment, and shall be satisfied that the efficiency of the consular service and the preservation of order among the citizens of the United States, resident at the ports or places where such officers are allowed, will be promoted thereby; and in the case of each of the said constables the Secretary of State may prescribe what surety shall be given to secure the faithful performance of duties which may be imposed upon them.

Constables of consular courts to be appointed.

SEC. 162. That there shall be appointed, under the provisions of this portion of this act, consular interpreters and marshals and constables of consular courts at the following-named places:

Places at which consular interpreters, &c., shall be appointed.

Interpreters: Amoy, (China,) Bangkok, (Siam,) Canton, (China,) Chin-Kiang, (China,) Constantinople, (Turkey,) Foo-Chow, (China,) Hioga and Osaka, (one, Japan,) Kanagawa, or at the place of official residence of the consul-general of the United States in Japan, Muscat, (Africa,) Nagasaki, (Japan,) Shanghai, (China,) Swatow, (China,) Tien-Tsin, (China,) Tangier, (Africa,) Tripoli, (Africa,) Tunis, (Africa;) sixteen in number.

Marshals of consular courts: Kanagawa, or at the place of official residence of the consul-general of the United States in Japan, and Shanghai, China; two in number.

Constables of consular courts: Amoy, Canton, Chin-Kiang, Foo-Chow, Hankow, Swatow, Tien-Tsin, in the empire of China; Hioga and Osaka, (one,) and Nagasaki, in Japan, and Constantinople, in Turkey; ten in number.

And jailers, if deemed necessary, in number equal to the number of consular jails authorized under the provisions of this act.

And the annual salaries of such consular interpreters and marshals and constables and jailers shall be in accordance with the provisions made thereto in section thirty-six of this act fixing the annual salaries of consular officers and others in the consular service of the United States.

SEC. 163. That the term of the appointment of all consular interpreters and marshals and constables shall be during the pleasure of the President, and all constables of consular courts during the pleasure of the Secretary of State, and no removals shall be made upon the recommendation of any principal consular officer over them except as hereinafter provided.

The term of appointment of consular clerks, interpreters, marshals, and constables.

SEC. 164. That no consular interpreter or marshal appointed under the provisions of this act shall be removed except for cause assigned, to be stated in writing, and to be first approved by the consul-general under whose jurisdiction the consulate to which the consular interpreter or marshal belongs, and to be further sanctioned by the President of the United States; and in the removal of a constable of a consular court the same as herein provided shall apply, except that such removal shall be sanctioned by the Secretary of State instead of the President.

Removals of consular clerks, &c.

SEC. 165. That it shall be the duty of the said marshals and constables, respectively, to execute process issued by the ministers of the United States in the said countries respectively, or by the consul-general or consul, or any one acting in their stead, at the port or place at which they reside, and to make due return of the same to the officer by whom

Duties of marshals and constables of consular courts.

the same was issued, and to conform in all respects to the regulations prescribed by the Secretary of State in regard to their duties.

May appoint jailers.

SEC. 166. That the Secretary of State may, upon the request of the principal consular officer, authorize the employment of jailers or other menials at such consulates where the same may seem indispensable for the reasons given.

Regulations for the government of consular courts to be established.

SEC. 167. That in order to organize and to carry into effect the system of jurisprudence demanded by such treaties, the Secretary of State and the Secretary of the Treasury, or some person appointed by them respectively on their behalf, and the Superintendent of the Consular Service, shall constitute a board to prescribe, from time to time, regulations for the government of proceedings in the consular courts of the United States, and to be used by any consular officer of the United States exercising judicial power, that is to say : To prescribe the forms of proceeding in civil cases, summons, pleadings; arrest and bail; claim and delivery; injunction, attachment, deposit in court; appointment of receivers; trial and judgment; issues, and their disposition; trials with assessors; how exceptions are to be taken, new trials commenced, executions to be issued and served; proceedings in matters supplemental to execution; foreclosing mortgages; how appeals are to be made, when, and in what matters; confession of judgment; submitting a controversy without action; how compromises may be effected; relating to witnesses; in what cases depositions may be taken and how; administration of oaths and affirmations; inspection of documents and writings; how writs of certiorari are to be acted upon; relating to writs of mandamus; relating to marriage, divorce, birth, and death; relating to steamers, vessels, and boats; matters relating to costs and fees; forms in dealing with habeas corpus; how to appoint and qualify assessors; and how criminal cases are to be proceeded with; and generally, without further enumeration, to make all such decrees and regulations from time to time needed and not inconsistent with the provisions of this act; and all such rules and regulations shall receive the approval of the President of the United States, and shall be binding and obligatory until annulled or modified by Congress; and that such approbation or disapproval may be had, it shall be the duty of the Secretary of State to submit all regulations, orders, or decrees to Congress, at the earliest moment after publication; and the regulations so prescribed shall go into operation as soon as practicable after the commencement of this act.

Consular officers to make suggestions.

SEC. 168. That it shall be the duty of all consuls of the United States exercising judicial powers under this act to report in writing, from time to time, to the consul-general or ranking consul of the countries in which they reside, respectively, all changes, modifications, or alterations which they may think necessary for the promotion of justice in the consular courts of the United States; and the said consul-general or ranking consul shall forward the same, with his opinions, to the Secretary of State, to be by him referred to the board provided for the preparation of regulations for the government of proceedings in consular courts and defining the duties of consular officers exercising judicial powers, to be by the said board acted upon in accordance with the provisions of the last before-mentioned section of this act.

All fines and fees incident to consular courts to be accounted for and remitted to the Secretary of the Treasury.

SEC. 169. That all fines and fees received under the proceedings of the consular courts of the United States, whether by the consular officer in the exercise of his judicial powers, or the marshal or constable, in serving any process or papers whatever, shall be accounted for, at the end of each quarter, by the consular officer at the port, to the Secretary of the Treasury, on behalf of the Government of the United States; and all balances still remaining, after defraying any expenses on account of the consulate, shall be remitted to the Secretary of the Treasury at the times aforesaid; and at the end of each fiscal year a general account of the same shall be inclosed with the reports of the consular officer respecting the exercise of judicial functions by himself during the said year; and the transmission of all accounts of fees and reports made shall be governed by the same rules as hereinbefore prescribed for consular fees and accounts.

Consular courts to be courts of record.

SEC. 170. That all consular courts of the United States shall be courts of record; and that the minutes of proceedings taken therein shall, in all cases, be drawn up and preserved with the depositions of the witnesses, and such minutes shall be signed by the officer holding the court, and shall, in cases where assessors are present, be open for the inspection of such assessors, and for their signature, if concurred in by them; and

all fees received on account of any copies of any records or documents in the possession of the court shall be accounted for as required for other services incident to the consular court or its officer; and in the collection of, and accounting for, fees of all kinds derived from the services of consuls as judicial officers, the same rules shall govern such fees as prescribed in this act for other fees.

SEC. 171. That all citizens of the United States of America residing within any of the countries named in this act, after reasonable public notice to that effect has been given by the consular officer of the United States within whose district they may be residing, shall enroll themselves in a register to be kept by such consular officer; and every citizen of the United States, after the commencement of this act, arriving at any place within the said dominions wherein a consular office of the United States is maintained, saving and except any citizen of the United States borne on the muster-roll of any ship or vessel of the United States arriving in the ports of such countries, shall, within a reasonable period, not to exceed thirty days after his arrival, enroll himself in such register, to be kept as aforesaid, and for that purpose he is required to apply in person at the consulate of the United States; and any citizen of the United States who shall refuse or neglect so to enroll himself, and shall not be able to excuse, to the satisfaction of the consular officer, his refusal or neglect, he shall not be entitled to require to be recognized or protected as a citizen of the United States, in any difficulties whatsoever in which he may be involved within the jurisdiction of such countries, and shall be subject to a fine of ten dollars; and in all cases where an applicant to be enrolled cannot furnish a passport or other legal proof of his citizenship, he shall be required to make an affidavit, in writing, that he is a citizen of the United States, which affidavit shall be filed by the consul-general, consul, or vice-consul; and the said consul-general, consul, or vice-consul shall also, if he think necessary, require other and further proof of the fact before enrolling such persons.

A register of citizens of the United States to be kept.

SEC. 172. That no fee or remuneration whatsoever shall be demanded or received by any consular officer of the United States for or on account of the enrollment of any citizen of the United States in the register aforesaid; and a notification of the period within which such enrollment must be effected shall be exhibited in some conspicuous place in the consular office; and any neglect to give such notification, if proven by any person, shall subject the consular officer to the penalty prescribed in this act for neglect to post a list of consular fees in a public place in his consulate.

No fee to be charged for enrollment.

SEC. 173. That as far as the provisions of this act, as hereinafter mentioned, may be applicable to crimes and offenses committed by citizens of the United States in any part of the dominions of the Sublime Porte, inclusive of Egypt, the same shall be executed by consuls-general and consuls of the United States, in conformity with existing treaties with the said country, or any treaties which may be hereafter made; and the said consuls-general and consuls are hereby ex officio vested with the powers herein conferred upon such the said officers in China for the purposes above expressed, so far as regards the punishment of crime, and also for the exercise of jurisdiction in civil cases, wherein the same is permitted by the laws of Turkey, or its usages, in its intercourse with the Franks or other foreign Christian nations.

The act as applied to the Turkish dominions.

SEC. 174. That the provisions of this act relating to the exercise of judicial powers shall extend to Egypt, and the consul-general for the said country, officially residing at Cairo, shall have the power so far as in conformity with the treaty between the United States and the Sublime Porte, and as allowed to be exercised by the consul-general or consul residing in a country where there is no minister.

Application to Egypt.

SEC. 175. That the provisions of this act as applied to the exercise of judicial powers by consuls, so far as the same are or may be in conformity with the stipulations in the existing or any future treaties between the United States and Tripoli, Tunis, Morocco, and Muscat, respectively, shall extend to those countries, and shall be executed, in conformity with the provisions of the said treaties and the provisions of this act, by consuls appointed by the United States to reside therein, who are hereby ex officio invested with the powers herein delegated to consuls of the United States to reside in the countries, so far as the same can be exercised under the provisions of treaties between the United States and the several countries mentioned in this section, and in accordance with the usages of the said countries in their intercourse with the Franks or other foreign Christian nations.

Application of judicial power to the Barbary States.

The act as applied to Persia.

SEC. 176. That the provisions of this act relating to the judicial powers of consuls be, and the same are hereby, extended to Persia, in respect to all suits and disputes which may arise between citizens of the United States therein; and the consuls who may be appointed to reside in Persia are hereby invested, in relation to the said suits and disputes, with such powers as are by this portion of this act conferred upon consuls in China, and all suits and disputes arising in Persia, between Persian subjects and citizens of the United States, shall be carried before the Persian tribunal, to which such matters are usually referred, at the place where a consul or agent of the United States may reside, and shall be discussed and decided according to equity, in the presence of an employé of the consul or agent of the United States; and it shall be the duty of the consul to attend the trial in person, and see that justice is administered, and all suits and disputes occurring in Persia between the citizens of the United States and the subjects of other foreign powers shall be tried and adjudicated by the intermeditation of their respective consuls, in accordance with such regulations as shall be mutually agreed upon by the minister of the United States, for the time being, and the ministers of such foreign powers respectively, which regulations shall from time to time be submitted to the Secretary of State.

Judicial powers in uncivilized countries.

SEC. 177. That the consuls of the United States at islands or in countries not inhabited by any civilized people, or recognized by any treaty with the United States, be, and the same are hereby, authorized to try, hear, and determine all cases in regard to civil rights, whether of person or property, where the real debt and damages do not exceed the sum of one thousand dollars, exclusive of costs; and upon full hearing of the allegations and evidence of both parties, to give judgment according to the laws of the United States, and according to the equity and right of the matter, in the same manner as justices of the peace are now authorized and empowered where the United States have exclusive jurisdiction. And the said consuls, respectively, are hereby invested with the powers conferred by this act, in such countries, for trial of offenses and misdemeanors.

Application of judicial powers to other uncivilized countries.

SEC. 178. That the provisions of this act relating to the exercise of judicial powers of consuls shall, in the same manner, extend to any country of like character, as hereinbefore mentioned, with which the United States may hereafter enter into treaty relations.

Superior authority over consular courts.

SEC. 179. That the superior judicial authority over consular courts of the United States in foreign countries, in all matters not inconsistent with the provisions of this act, is hereby vested in the Secretary of State; but in no wise shall this superior judicial authority be construed to relate to any matters of accounts, whether relating to fines, fees, or accounts in the settlement of the estates of citizens of the United States dying abroad. And in all cases relating to commerce, mercantile interests, ships, masters, seamen, or the affairs of citizens of the United States dying abroad, it shall be the duty of the consul to make return of the same, also, to the Secretary of the Treasury, in the manner and at such time as may be determined by the Secretary of the Treasury.

Consul-general or consul of the highest class to have supervisory powers over consuls in judicial matters.

SEC. 180. That the consul-general, or, if there be no consul-general, then the consul highest in rank in the country, shall exercise a supervisory authority over the judicial acts of all vice-consuls-general, consuls, or vice-consuls residing at ports or places within the countries or under the jurisdiction of the countries in which they reside respectively, and in the exercise of these supervisory powers they shall see that all the provisions of this act in respect to the exercise of judicial powers, as herein provided, are faithfully administered, and be governed as far as applicable by the provisions of this act relating to supervisory powers in other cases.

Powers of vice-consuls-general and vice-consuls in the award of punishments.

SEC. 181. That no vice-consul-general or vice-consul shall have power to award punishment, unless holding a commission from the Government of the United States, and any vice-consul-general or vice-consul not so commissioned, after having inquired of, tried, and determined any case of which he shall have had cognizance in pursuance of this act, shall report his proceedings and transmit the depositions to the principal consular officer of his district, and such principal consular officer shall have power to award punishment in the same manner as if the case had been inquired of, tried, and determined by himself.

SEC. 182. That any person acting temporarily and with the joint approval of the Secretary of State and the Secretary of the Treasury as consul or vice-consul, shall be competent to do all things which, by the several acts of Congress, consuls or vice-consuls are empowered to do.

Persons acting temporarily as consuls to have power.

SEC. 183. That the consuls of the United States, exercising judicial powers, shall in all matters co-operate with ministers of the United States where so prescribed by treaty, act of Congress, or regulations.

Consuls to co-operate with ministers of the United States.

SEC. 184. That each of the consuls-general, vice-consuls-general, consuls, and vice-consuls aforesaid, at the port for which he is appointed, shall be competent, under the authority herein contained, upon facts within his own knowledge, or which he has good reason to believe true, or upon complaint made, or information filed in writing and authenticated in such ways as shall be prescribed by the board hereinbefore constituted, to issue his warrant for the arrest of any citizen of the United States charged with committing in the country an offense against law, and, when arrested, to arraign and try any such offender, and, upon conviction, to sentence him to punishment in the manner hereinafter prescribed, always meting out punishment in a manner proportioned to the offense, which punishment shall in all cases, except as is hereinafter otherwise provided, be either fine or imprisonment.

May issue warrants for arrest of citizens of the United States, &c.

SEC. 185. That in regard to civil rights, whether of property or person, the said consuls-general, vice-consuls-general, consuls, and vice-consuls are hereby invested with all the judicial authority necessary to execute the provisions of all treaties as aforesaid respectively, and shall entertain jurisdiction in matters of contract at the port at which, or nearest to which, the contract was made, or at the port at which, or nearest to which, it was executed; and in all other matters at the port where, or nearest to which, the cause or controversy arose, or at the port where, or nearest to which, the damage complained of was sustained, any such port above named being always one of the ports at which the United States are represented by consuls-general or consuls; which jurisdiction shall embrace all controversies between citizens of the United States or others, provided for by such treaties, respectively.

Civil rights.

SEC. 186. That such jurisdiction in criminal and civil matters shall, in all cases, be exercised and enforced in conformity with the laws of the United States, which are hereby, so far as is necessary to execute such treaties, respectively extended over all citizens of the United States in the said countries, and over all others to the extent that the terms of the said treaties, respectively, justify or require, so far as such laws are suitable to carry the said treaties into effect; but in all cases where such laws are not adapted to the object, or are deficient in the provisions necessary to furnish suitable remedies, the common law, including equity and admiralty, shall be extended in like manner over such citizens and others in the said countries; and if defects still remain to be supplied, and neither common law, including equity and admiralty, nor the statutes of the United States, furnish appropriate and suitable remedies, these deficiencies will be submitted in writing by the consul to the consul-general or ranking consul of the country in which he resides; the consul-general or ranking consul will then submit the same, with any comments he may have to offer upon the same, to the Secretary of State, who will submit the same for investigation and decision to the board hereinbefore constituted for the preparation of rules and regulations for the government of proceedings in the consular courts of the United States, and the action of such board will be sanctioned and governed by the same rules as hereinbefore prescribed for the preparation of general rules and regulations for the use of the said consular courts.

How such jurisdiction shall be exercised.

SEC. 187. That any consul when sitting alone for the trial of offenses or misdemeanors shall finally decide all cases where the fine imposed does not exceed one hundred dollars, or the term of imprisonment does not exceed sixty days; and there shall be no appeal therefrom, except as hereinafter provided; but no fine imposed by a consul-general or consul, for a contempt committed in the presence of the court, or for failing to obey a summons from the same, shall exceed fifty dollars, nor shall the imprisonment exceed twenty-four hours for the same contempt.

What cases may be decided by consuls alone.

SEC. 188. That when sitting alone the consul may also decide all cases in which the fine imposed does not exceed five hundred dollars or the term of imprisonment does not exceed ninety days; but in all such cases, if the fine exceeds one hundred dollars, or the term of imprisonment for misdemeanor exceeds ninety days, the defendants, or any of them, if there be more than one, may take the case by appeal before

Certain cases decided by consuls sitting alone may be appealed.

the minister of the United States, if allowed jurisdiction, either upon errors of law or matters of fact, under such rules as may be prescribed by the board hereinbefore mentioned for the prosecution of appeals in such cases.

Assessors to be appointed in cases where legal questions involved.

SEC. 189. That whenever in any case the consul shall be of opinion that, by reason of the legal questions which may arise therein, assistance will be useful to him, or whenever he shall be of opinion that a severer punishment than those hereinbefore specified will be required, he shall, in either case, summon one or more citizens of the United States, not exceeding four in number, taken by lot from a list of individuals which shall have been submitted previously to the minister for his approval, but in capital cases not less than four, who shall be persons of good repute and competent to the duty, to sit with him in the trial, and who, after so sitting upon the trial, shall each enter upon the record his judgment and opinion and sign the same. The consul shall, however, give judgment in the case; but if his decision is opposed by the opinion of one or more of his associates, the case without further proceedings, together with the evidence and opinions, shall be referred to the minister for his final adjudication, either by entering up judgment therein, or remitting the same to the consul, with instructions how to proceed therewith; but in all such cases, except capital offenses, if the consul and his associates concur in opinion, the decision shall be final, except as hereinbefore provided.

Assessors to be appointed in certain civil cases.

SEC. 190. That the consuls aforesaid, and each of them, at the port for which he is appointed, shall have jurisdiction as is herein provided in all civil cases arising under treaties with the countries hereinbefore named, respectively, wherein the damage demanded does not exceed the sum of five hundred dollars; and if he sees fit to decide the same without aid, his decision thereon shall be final; but if, in his judgment, any case involves legal perplexities, and assistance will be useful, or if the damage demanded exceeds five hundred dollars, in either such case it shall be his duty to summon to his aid, from a list of individuals which shall have been nominated for the purposes of such trials to the minister and received his approval, not less than two nor more than three citizens of the United States, if such are residing at the port, of good repute and competent to the duty, who shall with him hear any such case; and if the consul and his associates concur in opinion, the judgment shall be final; but if the associates, or any of them, differ from the consul, the opinions of all shall be noted on the record, and each shall subscribe his name to his assent to, or dissent from, the consul, with such reasons therefor as he thinks proper to assign, and either party may thereupon appeal, under such regulations as may exist, to the minister; but if no appeal is lawfully claimed, the decision of the consul shall be final and conclusive.

Evidence to be taken in writing.

SEC. 191. That in all cases, criminal and civil, the evidence shall be taken down in writing in open court, under such regulations as may be made for that purpose; and all objections to the competency or character of testimony shall be noted, with the ruling in all such cases, and the evidence shall be part of the case.

Ministers may hear appeals.

SEC. 192. That the minister of the United States in the country to which he is appointed shall be fully authorized to hear and decide all cases, criminal and civil, which may come before him, by appeal, under the provisions of this act; and to issue all processes necessary to execute the power conferred upon him; and he is hereby fully empowered to decide finally any case upon the evidence which comes up with it, or to hear the parties further if he thinks justice will be promoted thereby; and such ministerial courts in all such trials by appeal, in the granting of new trials or in any other matters authorized by this act, will be governed by such rules as may be prescribed in the same manner by the board hereinbefore mentioned for the preparation of rules and regulations for the government of consular courts of the United States.

Punishment to be according to magnitude of the case.

SEC. 193. That in all cases, except as herein otherwise provided, the punishment for crime provided for by this act shall be by fine or imprisonment, or both, at the discretion of the officer who decides the case, but subject to the regulations prescribed for the government of the court and such as may hereafter be made; it shall, however, be the duty of each and every officer to allot punishment according to the magnitude and aggravation of the offense; and all who refuse or neglect to comply with the sentence passed upon them, shall stand committed until they do comply, or are discharged by order of the consul, with the consent of the minister in the country.

SEC. 194. That murder and insurrection, or rebellion against the government of either of the said countries, with intent to subvert the same, shall be capital offenses, punishable with death; but no person shall be convicted of either of said crimes unless the consul and his associates in the trial all concur in opinion, and the minister also approves of the conviction; but it shall always be lawful to convict one put upon trial for either of these crimes of a lesser offense of a similar character, if the evidence justifies it; and when so convicted, to punish, as for other offenses, by fine or imprisonment, or both.

Punishment of murder and insurrection.

SEC. 195. That whenever any one shall be convicted of either of the crimes punishable with death, as aforesaid, in either of the said countries, it shall be the duty of the minister to issue his warrant for the execution of such convict, appointing the time, place, and manner; but if the said minister shall be satisfied that the ends of public justice demand it, he may, from time to time, postpone such execution; and if he finds mitigating circumstances which may authorize it, he may submit the case to the President of the United States for pardon.

How criminals shall be executed.

SEC. 196. That in all criminal cases which are not of a heinous character it shall be lawful for the parties aggrieved or concerned therein, with the assent of the minister in the country, or consul, to adjust and settle the same among themselves, upon pecuniary or other considerations.

Arbitration recommended in certain criminal cases.

SEC. 197. That it shall be the duty also of the said ministers and consuls to encourage the settlement of controversies of a civil character by mutual agreement, or to submit them to the decision of referees, agreed upon by the parties, a majority of whom shall have power to decide the matter; and it shall be the duty of the board, as aforesaid, to prepare a form of submission for such cases, to be signed by the parties and acknowledged before the consul; and when the parties have so agreed to refer, the referees may, after suitable notice of the time and place of meeting for trial, proceed ex parte, in case either party refuses or neglects to appear, and, after hearing any case, may deliver their award, sealed, to the consul, who, in court, shall open the same; and if he accepts it, he shall indorse the fact, and judgment shall be rendered thereon, and execution issued in compliance with the terms thereof: *Provided, however,* That the parties may always settle the same before return thereof is made to the consul.

Settlements by mutual agreement recommended in civil cases.

SEC. 198. That in certain cases, it being expedient that such crimes and offenses committed within such foreign countries or places as aforesaid should be inquired of, tried, determined, and punished within the United States, it shall and may be lawful for any consular officer of the United States of America, having authority derived from the Government of the United States in that behalf, by warrant under the hand and seal of the Secretary of State, to cause any person charged with the commission of any crime or offense, the cognizance whereof may at any time appertain to any consular or other officer of the United States within any such country or place as aforesaid, to be sent for trial to the United States as the Secretary of State may appoint; and upon the arrival of such person within the United States, it shall and may be lawful for any of the courts of the United States exercising criminal jurisdiction to cause such person to be kept in safe and proper custody, and, so soon as conveniently may be, to inquire of, try, and determine such crime and offense, and, upon conviction of the person so charged as aforesaid, to punish him according to the laws in force in that behalf in the United States, in the same manner as if the said crime or offense had been committed within the jurisdiction of such United States court: *Provided always,* That before any such person shall be sent for trial to the United States as aforesaid, it shall be lawful for him to tender for examination to the consular or other proper officer of the United States to whom the cognizance of the crime or offense with which he is charged may appertain, within the country or place where the same may be alleged to have been committed, any competent witness or witnesses, the evidence of whom he may deem material for his defense, and whom he may allege himself to be unable to produce at his trial in the United States; and the said consular or other proper officer of the United States shall thereupon proceed in the examination and cross-examination of such witness or witnesses, in the same manner as though the same had been tendered at a trial before such consular or other proper officer of the United States, and shall cause the evidence so taken to be reduced into writing, and shall transmit a copy of such evidence

Power to send persons charged with crimes for trial to the United States.

to the United States court before which the trial of such person is to take place, together with a certificate, under his hand and seal, of the correctness of such copy; and thereupon it shall be lawful for the said United States court, and it is hereby required, to allow so much of the evidence so taken as aforesaid as would have been admissible according to the law and practice of the said United States court had the said witness or witnesses been produced and examined at the trial before the said court, to be read and received as legal evidence at such trial: *Provided also*, That if it shall be made to appear at such trial that the laws by which the person charged with any criminal act would have been tried had his trial taken place before a consular or other proper officer of the United States in the country or place in which such act may be alleged to have been committed, varying from or are inconsistent with the laws in force in the United States, in respect either of the criminality of the act charged, or of the nature or degree of the alleged crime or offense, or of the punishment to be awarded for the same, such court of the United States is hereby empowered and required to admit and give effect to the laws by which such person would have been so tried as aforesaid, so far as, but not further or otherwise than, the same relate to the criminality of such act, or to the nature or degree of such crime or offense, or to the punishment thereof: *Provided also*, That nothing herein contained shall be construed to alter or repeal any law, statute, or usage by virtue of which any crime or offense committed out of the United States might, at the time of the passing of this act, be inquired of, tried, determined, and punished within the United States, but the same shall remain in full force and effect, anything herein contained to the contrary notwithstanding.

Power to send
convicts for exe-
cution or impris-
onment to the
United States.

SEC. 199. That if any offender shall have been sentenced to suffer death or imprisonment for or in respect of any crime or offense of which such offender shall have been lawfully convicted, before any consular or other proper officer of the United States, within any such country or place as aforesaid, it shall be lawful for any person having authority expressed in writing from the Secretary of State in that behalf, by warrant under his hand and seal, to cause such offender to be sent to the United States, as he may designate, in order that the sentence so passed upon such offender may be carried into effect within the same; and the magistrates, jailers, and other officers to whom it may appertain to give effect to any sentence passed by the United States courts exercising criminal jurisdiction within the United States are hereby empowered and required to do all acts and things necessary to carry into effect the sentence so passed upon such offender, in the same manner as though the same had been passed by such United States court.

Limitation of
actions.

SEC. 200. That if any suit or action shall be brought, in any United States court, against any person or persons for anything done in pursuance of any such power or jurisdiction of any consular or other proper officer of the United States as aforesaid, or of this act, then, and in every such case, such action or suit shall be commenced or prosecuted within six months after the fact committed, and not afterward, except where the cause of action shall have arisen in a foreign country, and then within six months after the plaintiff or plaintiffs, and defendant or defendants, shall have been within the jurisdiction of the court in which the same may be brought; and the same, and every such action or suit, shall be brought at or near the place where the cause of action shall have arisen, and not elsewhere, except where the cause of action shall have arisen without the jurisdiction of the United States; and the defendant or defendants shall be entitled to the like notice, and shall have the like privilege of tendering amends to the plaintiff or plaintiffs, or their agent or attorney, as is provided in actions brought against any judge or magistrate for acts done in the execution of their offices; and the defendant or defendants, in every such action or suit, may plead the general issue, and give special matter in evidence; and if the matter or thing complained of shall appear to have been done under the authority and in execution of any such power or jurisdiction as aforesaid, or of this act, or of any such action, or if suit shall be brought after the time limited for bringing the same, or be brought and laid in any other place than the same ought to have been laid in, as aforesaid, then the jury shall find for the defendant or defendants; and if the plaintiff or plaintiffs shall become nonsuit or discontinue any action after the defendant or defendants shall have appeared, or if a verdict shall pass against the plaintiff or plaintiffs, or if upon demurrer judgment shall be taken against the plaintiff or plaintiffs, the defendant or defendants shall and

may recover treble costs, and have the like remedy for recovery thereof as any defendant or defendants take or have in any cases of law.

SEC. 201. That in all cases, in any of the countries named in this portion of this act, where a consular officer of the United States shall happen to be interested, either as a party or as a witness, the minister of the United States in the said countries, respectively, shall have original jurisdiction, and shall try, hear, and determine such cases according to the rules prescribed by this act. Ministers to have original jurisdiction in cases where consuls interested.

SEC. 202. That when any final judgment of the minister is given in the exercise of original or appellate criminal jurisdiction or in original or appellate jurisdiction in matters where the amount in dispute, exclusive of costs, exceeds the sum of three thousand dollars, an appeal may be made, and for that purpose a transcript of all necessary papers and proceedings in the case shall be submitted to the Secretary of State, under whose supervision the case shall be submitted to any United States court in the District of Columbia having jurisdiction, and no new evidence shall be received on the hearing of the appeal, and the appeals shall be subject to such rules, regulations, and restrictions prescribed in law for writs of error in any of the said courts; and the courts hereinbefore named, or any of them, are hereby authorized and required to receive, hear, and determine the appeals hereinbefore mentioned, and the decision of the court shall be final. Appeal from the minister in criminal cases, &c.

SEC. 203. That on any final judgment in a consular court of the United States where the matter in dispute exceeds five hundred dollars exclusive of costs, an appeal shall be allowed to the minister in the countries respectively, and in all cases such appeals must be governed by the rules and regulations prescribed as hereinbefore mentioned, and all such ministers are authorized and required to receive, hear, and determine such appeals. Appeals from the consuls.

SEC. 204. That the appeals allowed by the provisions of this act shall only be admitted in cases arising after this act shall take effect. When appeals shall begin.

SEC. 205. That consuls of the United States in countries where judicial powers are allowed shall keep a police report, in form to be prescribed by the Secretary of State, and will deliver to the minister, on his requisition, a copy of the whole or any portion thereof, and on the first day of September of each year a copy of the said report for the whole year will be sent to the Secretary of State. A police report to be kept.

SEC. 206. That all citizens of the United States sent out of the country by order of the consul, for cause stated, shall be reported by the consul to the minister and to the Secretary of State, giving the reasons therefor, and the said consul shall declare that the said person shall be no longer protected in the said country as a citizen of the United States, and any person twice convicted in a consular court for any offense shall be sent out of the country and not be allowed to return. Citizens sent out of the country to be reported.

SEC. 207. That it shall be the duty of consuls exercising judicial powers to report to the Secretary of State each year, on the first day of September, the condition and extent of the judicial business within their jurisdiction respectively during the previous year, and at the same time shall make returns of civil suits adjudicated at their consulates during the same period, and the said returns shall be made in accordance with Schedule B to this act appended, and any other returns which shall at any time be required by the Secretary of State shall be made as directed by the said officers respectively. Returns of civil suits to be made.

SEC. 208. That the powers heretofore exercised by diplomatic representatives of the United States in any of the countries in which judicial functions are accorded to ministers and consuls shall continue to be so exercised, except where such powers are inconsistent with the provisions of this act. Powers of ministers the same as before except in certain cases.

SEC. 209. That the Secretary of the Treasury be, and he is hereby, authorized to allow, in the adjustment of the accounts of each of the said consuls, the actual expenses of the rent of suitable buildings, or parts of buildings, to be used as prisons for American convicts in the countries hereinbefore named where consuls are permitted to exercise judicial powers, not to exceed, in any case, the rate of six hundred dollars a year; and, also, the wages of the keepers of the same and for the care of offenders, not to exceed, in any case, the sum of one thousand dollars per annum. Provisions for the payment of expenses incidental to the judicial powers of consuls.

SEC. 210. That no consular prisons for American convicts shall be allowed in any of the countries aforesaid, except upon the written statement of the reasons therefor, by the consul of the United States residing in the country. No prisons to be opened except with the sanction of the Pr

dent at the port, which must be forwarded to the consul-general or ranking consul of the United States in the country, and be approved, or otherwise, by him, giving reasons in either case, and then be forwarded to the Secretary of State for the sanction of the President of the United States; and in no case shall such prison be allowed unless the consular officer requesting the same makes oath or affirmation that the place is secure and suitable, and is expressly and solely devoted to that purpose.

Consuls may call upon the local authorities to assist them.

SEC. 211. That the consuls-general and consuls aforesaid shall be fully authorized to call upon the local authorities to sustain and support them in the execution of the powers confided to them by said treaty, and on their part to do and perform whatever is necessary to carry the provisions of said treaties into full effect so far as they are to be executed in the said countries respectively.

Annual reports to be made of the means of executing sentences.

SEC. 212. That it shall be the duty of all consuls of the United States to report on the first day of September of each year to the Secretary of State upon the means at their disposal for executing sentences of imprisonment, and whenever recourse is had to the prisons of the country it shall be their duty to arrange with the local authorities that any citizen of the United States who may be confined therein may be visited daily by any person appointed by the consul, and, if necessary, by a medical officer deputed for that purpose.

Marriages in the presence of consular officers in foreign countries valid.

SEC. 213. That all marriages, in the presence of any consular officer in a foreign country, between persons who would be authorized to marry if residing in the District of Columbia, shall have the same force and effect, and shall be valid to all intents and purposes, as if the said marriage had been solemnized within the United States. And in all cases of marriage before any consular officer, the said consular officer shall give to each of the parties a certificate of such marriage, and shall also send a certificate thereof to the Department of State, there to be kept; which certificate shall specify the names of the parties, their ages, places of birth, and residence.

CONCLUSION.

Commencement of this act.

SEC. 214. That this act shall come into operation as follows: From section nine to section eighteen, inclusive, to take effect immediately upon the passage of this act, in so much as may be necessary to the organization of the Bureau of the Consular Service, in view of the commencement of the whole act, and the remainder of the act shall commence on the first day of July, eighteen hundred and seventy-three.

SCHEDULE A. [SECTION 90.]

Copies of forms to be used by consular officers of the United States for the prevention of abuse⁸ in the transportation of Chinese passengers in American vessels.

FORM NO. 1.

CONSULATE OF THE UNITED STATES,
_____, _____, 18—.

List of Chinese passengers per American steamer _____, Captain _____, from _____ to _____.

No.	Name in Chinese characters.	Translation of name.	No.	Name in Chinese characters.	Translation of name.
1			5		
2			6		
3			7		
4			8		

NOTE.—The above form is written out and ruled to suit the number of passengers, consular stamp and stamp of Chinese broker on each page. Must contain the signature of the agent of the steamship company or vessel; signature of the captain of the vessel; signature of the consul of the United States.

FORM No. 2.

ON BOARD THE AMERICAN _____,
_____, _____, 18—.

I, interpreter of the United States consulate, do certify that I have personally examined passengers Nos. — to —, in all —, in the presence of —; that the names of the passengers examined by me are written both in Chinese and English on the roll, Form No. 1, herewith; and that the said passengers are bona fide emigrants or passengers to —.

_____,
United States Interpreter.

CONSULATE OF THE UNITED STATES,
_____, _____, 18—.

The total number of passengers examined by me, through my interpreter, as stated above, is —.

_____,
United States Consul.

NOTE.—This form is signed by the interpreter and certified by the consul, and receives the consular seal.

FORM No. 3.

CONSULATE OF THE UNITED STATES,
_____, _____, 18—.

I, _____, do solemnly and truly swear that the persons named in the roll now produced and hereunto annexed are emigrants to —, by the American —, and that the said roll contains a true and faithful list of all the Chinese passengers or emigrants by said ship; and that said passengers are not laborers known as coolies, intended to be transported from this port, or from —, to any port of South America, or the adjacent islands, or others, contrary to the true intent and meaning of the act of Congress approved February twenty-ninth, eighteen hundred and sixty-two, read to me on or before the — day of —, eighteen —, by the United States consul at this port.

Sworn to and subscribed before me.

NOTE.—This form is signed by the agent of the vessel, and receives the consular stamp.

FORM No. 4.

CONSULATE OF THE UNITED STATES,
_____, _____, 18—.

Know all men by these presents that we, _____, _____, and _____, are held and firmly bound to —, United States consul for —, China, in the sum of five thousand dollars, to the payment whereof we bind ourselves jointly and severally, our joint and several heirs, executors, and administrators.

Witness our hands and seals this — day of —, 18—.

The condition of the above obligation is such that if the passengers or emigrants named in the roll herewith, and marked by the said — and —, shall truly and faithfully be landed at the place or places specified in the said roll, then this obligation to be void, otherwise to remain in full force.

_____.

Signed, sealed, and delivered in the presence of—
_____.

NOTE.—This form is signed by the agent of the vessel and the captain of the vessel, and receives the consular stamp and the stamp of the Chinese broker.

FORM No. 5.

CONSULATE OF THE UNITED STATES,
_____, _____, 18—.

I, the undersigned, _____, United States consul, do certify that the roll of emigrants to _____, by the American _____, herewith, was read on board the said vessel, and that the same was explained by me to the parties whose names are subscribed thereto, each of whom personally acknowledged that he fully understood the same, and that he was a bona-fide emigrant or passenger to _____.

_____,
United States Consul.

NOTE.—The signature and seal of the consul are affixed to this form, No. 5.

SCHEDULE B. [SECTION 207.]

RETURNS OF CIVIL SUITS.

Return of civil suits adjudicated at the consulate of the United States during the year, and the number of suits in which American plaintiffs residing within the district have had occasion to resort to the consular court of European powers, and a similar return in which other parties appeared in consular courts of the United States.

FORM No. 1.

CONSULATE OF THE UNITED STATES OF AMERICA AT _____.

Return of civil suits in the year _____, in which the defendants were under protection of the United States.

No.	Date of first proceeding.	Name and nationality of plaintiff.	Name of defendant.	Nature of suit.	Judgment for plaintiff.	Appeal.

FORM No. 2.

CONSULATE OF THE UNITED STATES OF AMERICA AT _____.

Return of civil suits in the year _____, in which the plaintiffs only were under protection of the United States.

No.	Date of first proceeding.	Name of plaintiff.	Name and nationality of defendant.	Nature of suit.	Judgment.	Appeal.	Court of appeal.

FORM NO. 3.

CONSULATE OF THE UNITED STATES OF AMERICA AT ———.

Return of civil suits in the year ———, in which foreign parties in their differences with parties under protection of the United States have submitted to the jurisdiction of American consular court.

No.	Date of first proceedings.	Name and nationality of plaintiff.	Name and nationality of defendant.	Nature of suit.	Judgment.	Appeal.

FORM NO. 4.

LEGATION OF THE UNITED STATES OF AMERICA AT ———.

Return of appeals for decisions of consular courts in civil suits in the year ———.

No.	Date of appeal.	From what court.	Name and nationality of appellant.	Name and nationality of respondent.	Nature of suit.	Judgment.	Further appeal.

SCHEDULE C.—Of acts and parts of acts repealed by the consular act of 187—.

Reference to act.	Title of act.	Extent of repeal.
Statutes at Large, vol. 1, page 255.	An act concerning consuls and vice-consuls, approved April 14, 1792.	The first section of this act was repealed by the act approved July 7, 1798. Section 4 repealed by the thirty-third section of the act approved August 18, 1856. The fifth section was modified by the second, fifth, thirteenth, and thirty-third sections of the act approved August 18, 1856. The seventh and eighth sections repealed by the fifth section of the act of February 28, 1803. The whole of the remainder of the act remaining in force to be repealed.
Statutes at Large, vol. 11, page 203.	An act supplementary to the "Act concerning consuls and vice-consuls, and for the further protection of American seamen," approved February 28, 1803.	The whole act remaining in force.
Statutes at Large, vol. 11, page 651.	An act in addition to the act entitled "An act supplementary to the act concerning consuls and vice-consuls, and for the further protection of American seamen," approved February 28, 1811.	The whole act remaining in force.
Statutes at Large, vol. 4, page 773.	An act to prevent the punishment of consuls, commercial agents, and others in certain cases, approved March 3, 1835.	The whole act.

SCHEDULE C.—*Of acts and parts of acts repealed, &c.*—Continued.

Reference to act.	Title of act.	Extent of repeal.
Statutes at Large, vol. 5, page 394.	An act in addition to the several acts regulating the shipment and discharge of seamen and the duties of consuls, approved July 20, 1840.	The fifth, sixth, and seventh sections of this act already repealed by the thirty-third section of the act approved August 18, 1856. The whole act, except the above sections.
Statutes at Large, vol. 5, page 507.	An act requiring foreign regulations of commerce to be annually laid before Congress, approved August 16, 1842.	The whole act.
Statutes at Large, vol. 5, page 725.	An act to amend the act entitled "An act to provide for the enlistment of boys for the naval service, and to extend the term of enlistment of seamen," approved February 20, 1845.	Section 2 of the act.
Statutes at Large, vol. 5, page 748.	An act to provide for the transportation of the mail between the United States and foreign countries, and for other purposes, approved March 3, 1845.	Section 6 of the act.
Statutes at Large, vol. 9, page 440.	An act to provide for recording the conveyances of vessels, and for other purposes, approved July 29, 1850.	Section 6 of the act.
Statutes at Large, vol. 11, page 139.	An act to amend an act entitled "An act requiring foreign regulations of commerce to be laid annually before Congress, approved August sixteen, eighteen hundred and forty-two, and for other purposes," approved August 18, 1856.	The whole act.
Statutes at Large, vol. 11, page 52.	An act to regulate the diplomatic and consular systems of the United States, approved August 18, 1856.	Sections 3, 4, 5, 6, 7, 8, 11, and all other sections, excepting the thirty-third, which follow thereafter.
Statutes at Large, vol. 11, page 404.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending the thirtieth of June, eighteen hundred and sixty, approved March 3, 1859.	Sections 2 and 3 of the act.
Statutes at Large, vol. 12, page 72.	An act to carry into effect provisions of the treaties between the United States, China, Japan, Siam, Persia, and other countries, giving certain judicial powers to ministers and consuls, or other functionaries of the United States in those countries, and for other purposes, approved June 22, 1860.	So much of the whole act as relates to consular officers, courts, marshals, and jails.
Statutes at Large, vol. 12, page 315.	An act to reduce consular fees for vessels running to or between foreign ports, approved August 5, 1861.	The whole act.
Statutes at Large, vol. 12, page 335.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending the thirtieth of June, eighteen hundred and sixty-three, and additional appropriations for the year ending the thirtieth of June, eighteen hundred and sixty-two, approved February 4, 1862.	So much of the act as relates to the compensation to be allowed to certain consulates therein named.
Statutes at Large, vol. 12, page 340.	An act to prohibit the "coolly trade" by American citizens in American vessels, approved February 19, 1862.	That portion of section 4 relating to the duties of consular officers.
Statutes at Large, vol. 12, page 421.	An act to authorize the President of the United States to appoint diplomatic representatives to the republics of Hayti and Liberia, respectively, approved June 5, 1862.	Such portion of the act as accredits the commissioner of the United States also as consul-general to Hayti, and as relates to the compensation allowed to the commissioner and consul-general of the United States to Liberia.
Statutes at Large, vol. 12, page 638.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June thirtieth, eighteen hundred and sixty-four, approved February 4, 1863.	Such portion of the act as fixes the salary of the consul at Guayamas.
Statutes at Large, vol. 12, page 754.	An act making appropriations for sundry civil expenses of the Government for the year ending June thirty, eighteen hundred and sixty-four, and for the year ending the thirtieth of June, eighteen hundred and sixty-three, and for other purposes, approved March 3, 1863.	Section 24 of the act.
Statutes at Large, vol. 13, page 61.	An act to provide for the collection of hospital dues from vessels of the United States sold or transferred in foreign ports or waters, approved April 29, 1864.	The whole act.
Statutes at Large, vol. 13, page 137.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending the thirtieth of June, eighteen hundred and sixty-five, and for other purposes, approved June 20, 1864.	Such portions of the act as fixes the salaries to be paid to certain consulates therein specified, and sections 2 and 4.

SCHEDULE C.—*Of acts and parts of acts repealed, &c.*—Continued.

Reference to act.	Title of act.	Extent of repeal.
Statutes at Large, vol. 14, page 224.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending thirtieth June, eighteen hundred and sixty-seven, and for other purposes, approved July 25, 1866.	Such portions as fix the salaries to be paid to certain consulates, and so much of section 3 as relates to the application of fees in certain cases.
Statutes at Large, vol. 14, page 332.	An act making appropriations for sundry civil expenses of the Government for the year ending June thirtieth, eighteen hundred and sixty-seven, and for other purposes, approved July 28, 1866.	So much of section 11 of the act as applies to the consulate-general of the United States in Egypt, and to the powers of the agent and consul-general in the said country.
Statutes at Large, vol. 14, page 412.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending thirtieth June, eighteen hundred and sixty-eight, and for other purposes, approved February 28, 1867.	So much of the act as fixes the salaries to be paid to certain consulates therein named.
Statutes at Large, vol. 15, page 57.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending thirtieth June, eighteen hundred and sixty-nine, and for other purposes, approved March 30, 1868.	So much of the act as fixes the salaries to be paid to certain consulates therein specified, and sections 2 and 3.
Statutes at Large, vol. 15, page 265.	An act authorizing the admission in evidence of copies of certain papers, documents, and entries, approved January 8, 1869.	The whole act.
Statutes at Large, vol. 15, page 319.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending June thirtieth, eighteen hundred and seventy, and for other purposes, approved March 3, 1869.	Sections 2, 3, 5, and 6 of the act.
Statutes at Large, vol. 16, page 183.	An act to amend an act entitled "An act to carry into effect provisions of the treaties between the United States, China, Japan, Siam, Persia, and other countries, giving certain judicial powers to ministers and consuls and other functionaries of the United States in those countries, and for other purposes, approved June twenty-second, eighteen hundred and sixty," approved July 1, 1870.	The whole act.
Statutes at Large, vol. 16, page 305.	An act making appropriations for sundry civil expenses of the Government for the year ending June thirty, eighteen hundred and seventy-one, and for other purposes, approved July 15, 1870.	So much of the act as fixes the salary of the consul at Port Said, Egypt.

SCHEDULE D.—*Of acts or parts of acts not to be repealed.*

Reference to act.	Title of act.	Extent not to be repealed.
Statutes at Large, vol. 3, page 729.	An act supplementary to and to amend an act entitled "An act to regulate the collection of duties on imports and tonnage, passed second March, one thousand seven hundred and ninety-nine, and for other purposes," approved March 1, 1823.	Sections 7 and 8 not to be repealed, but to remain as modified or superseded by the first section of the act of March 3, 1863, the act of March 2, 1867, and the provisions of this act.
Statutes at Large, vol. 5, page 548; section 16, page 563, chapter 270.	An act to provide revenue from imports, and to change and modify existing laws imposing duties on imports, and for other purposes, approved August 30, 1842.	Section 16 not to be repealed except in so far as may be inconsistent with the provisions of this act.
Statutes at Large, vol. 11, page 52.	An act to regulate the diplomatic and consular systems of the United States, approved August 18, 1856.	Sections 1, 2, 9, and 10.
Statutes at Large, vol. 12, page 72.	An act to carry into effect provisions of the treaties between the United States, China, Japan, Siam, Persia, and other countries, giving certain judicial powers to ministers and consuls, or other functionaries of the United States in those countries, and for other purposes, approved June 22, 1860.	Such parts of the act as relate to ministers, their powers, and ministerial courts.
Statutes at Large, vol. 12, page 340.	An act to prohibit the "coolie trade" by American citizens in American vessels, approved February 19, 1862.	The whole act, except that portion of section 4 as relates to the duties of consular officers.
Statutes at Large, vol. 12, page 421.	An act to authorize the President of the United States to appoint diplomatic representatives to the republics of Hayti and Liberia, respectively, approved June 5, 1862.	Such portions of the act as relate to the appointment of diplomatic representatives.

SCHEDULE D.—*Of acts or parts of acts not to be repealed*—Continued.

Reference to act.	Title of act.	Extent not to be repealed.
Statutes at Large, vol. 12, page 558.	An act increasing temporarily the duties on imports, and for other purposes, approved July 14, 1862.	No portions of sections 17, 18, and 19 relating to invoices and the duties of consular officers, unless inconsistent with the provisions of this act.
Statutes at Large, vol. 12, page 737.	An act to prevent and punish frauds upon the revenue, to provide for the more certain and speedy collection of claims in favor of the United States, and for other purposes, approved March 3, 1863.	The whole act, except in so far as may be in conflict with this act.
Statutes at Large, vol. 13, pages 14-17.	An act to increase the internal revenue, and for other purposes, approved March 7, 1864.	That portion of section 8 relating to income tax in the cases of consuls of foreign countries not citizens of the United States.
Statutes at Large, vol. 13, page 137.	An act making appropriations for the consular and diplomatic expenses of the Government for the year ending the thirtieth of June, eighteen hundred and sixty-five, and for other purposes, approved June 20, 1864.	Section 3 of the act.
Statutes at Large, vol. 13, page 201.	An act repealing certain provisions of law concerning seamen on board public and private vessels of the United States, approved June 28, 1864.	The whole act, unless inconsistent with the provisions of this act.
Statutes at Large, vol. 13, page 305.	An act to provide ways and means for the support of the Government, and for other purposes, approved June 30, 1864.	Section 178 of the act.
Statutes at Large, vol. 13, page 217.	An act to increase duties on imports, and for other purposes, approved June 30, 1864.	Section 27 of the act, unless inconsistent with the provisions of this act.
Statutes at Large, vol. 13, page 532.	An act further to provide for the verification of invoices, approved March 3, 1865.	The whole act, except in so far as may be inconsistent with this act.
Statutes at Large, vol. 15, page 226.	An act to amend section one of "An act to prevent and punish frauds upon the revenue, and for other purposes," approved March third, eighteen hundred and sixty-three, approved July 27, 1868.	The whole act, unless inconsistent with the provisions of this act.

PAYMENTS TO THE UNION PACIFIC RAILROAD COMPANY
BY THE WAR DEPARTMENT.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

*A statement of the amounts paid to the Union Pacific Railroad Company
since June 30, 1866.*

FEBRUARY 8, 1873.—Referred to the Select Committee on the Credit Mobilier (No. 2)
and ordered to printed.

WAR DEPARTMENT, *January 31, 1873.*

The Secretary of War has the honor to transmit to the House of Representatives, in compliance with the resolution of the 20th instant, the accompanying report of the Quartermaster-General, showing the amount paid to the Union Pacific Railroad Company for transportation in each fiscal year since June 30, 1866, with an estimate of what said transportation would have cost if said railroad had not been constructed.

WM. W. BELKNAP,
Secretary of War.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., January 28, 1873.

To the honorable the Secretary of War :

SIR: I have the honor to return herewith the resolution of the House of Representatives, (on motion of Mr. Palmer, January 20th, instant,) requesting a statement of amounts paid to the Union Pacific Railroad for transportation in each fiscal year since June 30, 1866, with an estimate of the amount said transportation would have cost if said railroad had not been constructed.

In reply I have to submit herewith the inclosed statement, showing the amounts paid by the Government for transportation of troops and supplies in each year, as required by the resolution.

The total yearly payments were as follows :

	Troops.	Baggage and supplies.
1866-'67	\$73,312 03	\$38,135 43
1867-'68	191,389 15	780,355 12
1868-'69	106,130 77	372,365 02
1869-'70	300,722 30	187,529 70
1870-'71	396,113 07	304,670 76
1871-'72	273,741 98	204,431 44
1872, to January 28, 1873	104,852 95	15,498 33
Totals	<u>1,446,262 25</u>	<u>1,902,985 80</u>

In addition to the above the following amounts have been paid for expressage on paymasters' funds and for transmission of telegrams :

	Expressage.	Telegrams
1866-'67		\$7 97
1867-'68		831 51
1868-'69		1,185 81
1869-'70		361 10
1870-'71	\$1,988 43	4,415 77
1871-'72	2,599 85	1,302 81
1872, to January 28, 1873	932 35	82 86
Totals	<u>5,520 63</u>	<u>8,187 83</u>

These amounts, added to the cost for movement of troops, supplies, and baggage, make a sum-total earned on all business for this Department, during the period required, of \$3,362,956.51, one-half of which has been paid in cash, and the other half credited to the company as required by section 5 of the act of July 2, 1864, (less \$11,916.86, losses on United States property.)

The average rates per mile for troops are, on through business, $5\frac{2}{10}$ cents; on local business, 8 cents, being an average of $6\frac{3}{5}$ cents per man per mile.] The average rates per mile for troops by the Overland Stage Company were, on through business, $12\frac{1}{2}$ cents; on local business, 15 cents, being an average of $13\frac{3}{4}$ cents per mile per man.

Assuming that all of these troops would have traveled by stage, in the absence of the railroad, (which is by no means probable,) the total estimated cost by stage is shown by the following, based on the averaged rates above stated:

Average rate per man per mile: rail	$6\frac{3}{5}$ cents.
Average rate per man per mile: stage	$13\frac{3}{4}$ cents.
Actual cost for troops at railroad rates	\$1,446,262.25
Estimated cost at stage rates	\$3,013,046.35

The average rates per 100 pounds per 100 miles charged for freight by the railroad during the period required are, on through business, 19 cents; on local business, 62 cents, being an average of $40\frac{1}{2}$ cents per 100 pounds per 100 miles by railroad.

Previous to the existence of the Union Pacific Railroad, military supplies were transported by wagon, under contract, over what was known as route No. 1, [from the Missouri River, north of and including Fort Leavenworth, and south of latitude 40° north, to all posts and depots in the Territory of Colorado north of latitude 40° north, and in the Territories of Nebraska, Dakota, Idaho, Montana, and Utah south of latitude 44° north and east of longitude 114° west of Greenwich;] the yearly rates on this route until superseded by the railroad, and thereafter on the contiguous route No. 2, [from Forts Leavenworth and Riley, and from Kansas City, to posts in Kansas and Colorado Territory south of latitude 40° north, and to posts in New Mexico,] were as follows, as shown by the

contracts for those routes, viz: 1866, \$1.45; 1867, \$1.64; 1868, \$1.99; 1869, \$1.55; 1870, \$1.18; 1871, \$1.21; 1872, \$1.17½, being an average of about \$1.46 per hundred pounds per hundred miles.

At this average rate the estimated cost of the transportation of the freight moved by the Union Pacific Railroad, including express charges as shown above, during the time commencing July, 1866, and ending January 28, 1873, would be as follows:

Rates per 100 pounds per 100 miles: railroad rates.....	40½ cents.
Rates per 100 pounds per 100 miles: wagon rates.....	\$1 46
Actual cost of freight at railroad rates.....	\$1, 896, 589 57
Estimated cost at wagon rates.....	\$6, 837, 088.32
Showing a total estimated cost for moving the troops and supplies by stage and wagon of.....	\$9, 850, 134 67
Total actual cost by railroad.....	3, 342, 851 82
Estimated difference.....	6, 507, 282 85

equivalent to about 66 per cent.

I am, very respectfully, your obedient servant,

M. C. MEIGS,

Quartermaster-General, Brevet Major-General, U. S. A.

UNION PACIFIC RAILROAD COMPANY.

Statement of transportation, express, and telegraphic service performed, showing the amount of money paid for the same by the Government from appropriations for the Army, in each fiscal year since 1866, to the Union Pacific Railroad Company.

Fiscal year ending June 30.	No. of men.	No. lbs. baggage.	No. lbs. freight.	Cost for men.	Cost for baggage.	Cost for freight.	Cost of expressage.	Cost of telegrams.	Total cost of service.	Deductions for losses U. S. property.	Net amount paid.	In cash.	Credited on bonds.
1867	3,533	54,720	5,492,603	\$73,312 03	\$1,163 97	\$36,971 46	.....	\$7.97	\$111,455 43	\$54 63	\$111,400 80	\$55,700 40	\$55,700 40
1868	7,603	1,220	40,655,263	191,389 15	16 77	780,338 35	.....	831 51	972,575 78	3,289 86	969,285 92	484,642 95	484,642 97
1869	6,402	.....	21,593,726	106,130 77	.....	372,365 02	.....	1,185 81	479,681 60	1,146 82	478,534 78	239,267 38	239,267 40
1870	7,209	15,352	13,437,858	300,722 30	507 56	187,022 14	.....	361 10	488,613 10	1,324 94	487,288 16	243,644 08	243,644 08
1871	11,137	76,885	26,111,514	396,113 07	2,673 63	301,997 13	\$1,988 43	4,415 77	707,188 03	5,941 73	701,246 30	350,623 17	350,623 13
1872	8,084	33,093	23,727,889	273,741 98	1,185 36	203,246 08	2,599 85	1,302 81	482,076 08	145 89	481,930 19	240,965 08	240,965 11
1873 a.....	2,439	720	1,568,501	104,852 95	41 83	15,456 50	932 35	82 86	121,366 49	12 99	121,353 50	60,676 74	60,676 76
Total.....	46,407	181,990	132,587,354	1,446,262 25	5,589 12	1,897,396 68	5,520 63	8,187 83	3,362,956 51	11,916 86	3,351,039 65	1,675,519 80	1,675,519 85

RECAPITULATION.

Cost of men.....	\$1,446,262 25
Cost of baggage.....	5,589 12
Cost of freight.....	1,897,396 68
Cost of expressage.....	5,520 63
Cost of telegrams.....	8,187 83
Total cost of service.....	3,362,956 51
Deduct for losses United States property.....	11,916 86
Total amount paid.....	<u>\$3,351,039 65</u>

M. C. MEIGS,
Quartermaster-General, Brevet Major-General, U. S. A.

QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., January 29, 1873.

Official:

M. I. LUDINGTON, Quartermaster, U. S. A.

a To January 28. b One-half cash, one-half credited on bonds, but all taken from appropriations for Quartermaster's Department.

FAILURE OF MERCHANTS' NATIONAL BANK, D. C.

LETTER

FROM THE

COMPTROLLER OF THE CURRENCY,

TRANSMITTING

Copies of all papers on file in his office relating to the failure of the Merchants' National Bank of the District of Columbia; also correspondence relating to certain bonds deposited in said bank by Joseph B. Stewart prior to its failure.

FEBRUARY 8, 1873.—Referred to the Select Committee on Credit Mobilier (No. 2) and ordered to be printed.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, February 1, 1873.

SIR: I have the honor to acknowledge the receipt of a resolution of the 30th ultimo, "requesting the Comptroller of the Currency to communicate to this House copies of all papers on file in his office relating to the failure of the Merchants' National Bank of Washington, D. C., together with copies of all correspondence with the Ocean National Bank of New York as to the ownership of certain Pacific Railroad bonds deposited in said Merchants' National Bank by Joseph B. Stewart prior to its failure."

The report of the national-bank examiner, made to this office on the 11th day of May, 1866, exhibiting the condition of the Merchants' National Bank of Washington immediately after its suspension is not among the files of this office. A resolution of the House of Representatives of the 8th day of May, 1866, directed the Committee on Banking and Currency "to examine into all the facts and circumstances connected with the recent failure of the Merchants' National Bank of Washington, and report to the House the amount of money deposited in the said bank, and by whom, the causes of its failure, and also what further legislation is necessary in regard to the national banks to protect the public and the Government, and that the said committee be empowered to send for persons and papers, and examine witnesses under oath;" and it is supposed that all the papers then on file in this office relating to the failure of this bank were placed in the hands of that committee, in accordance with the terms of the resolution. The receiver of the Merchants' National

Bank, who was appointed May 8, 1866, informs me that there were no Union Pacific Railroad bonds among the assets at the time he took possession of the bank; neither was there any account or memorandum on the books or papers to indicate that the bank had ever held Union Pacific bonds, although it was reported that Mr. Joseph B. Stewart had deposited bonds of this kind in the hands of Mr. Leonard Huyck individually, who was then president of the bank.

There is no correspondence on file in this office with the Ocean National Bank of New York in reference to the ownership of the Pacific Railroad bonds referred to in the resolution.

I am, very respectfully, your obedient servant,

JNO. JAY KNOX,
Comptroller.

Hon. JAMES G. BLAINE,
Speaker of the House of Representatives.

BUILDING FOR BUREAU OF ENGRAVING AND PRINTING.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

An estimate of the cost of a suitable building for the use of the Bureau of Engraving and Printing, and the storage of the books and papers of his Department.

FEBRUARY 8, 1873.—Referred to the Committee on Public Buildings and Grounds and ordered to be printed.

TREASURY DEPARTMENT,
Office of the Secretary, February 6, 1873.

SIR: I have the honor to transmit herewith an estimate, prepared by the Supervising Architect of the Treasury, of the cost of a suitable building for the use of the Bureau of Engraving and Printing, and the storage of the books and papers of this Department, in conformity to the recommendation made by me upon that subject in my last annual report.

Very respectfully,

GEO. S. BOUTWELL,
Secretary.

Hon. JAMES G. BLAINE,
Speaker House of Representatives.

TREASURY DEPARTMENT,
Office of Supervising Architect, February 4, 1873.

SIR: According to instructions I have prepared a careful estimate of the cost of a building for the accommodation of the Bureau of Engraving and Printing and for the files of the Department. I recommend the erection of a building 250 feet in length, 72 feet 6 inches in width, four stories in height, with a basement, the basement story to be built with ranged rubble-work and a superstructure of hard brick; the main front to be faced with pressed brick; the building to be entirely plain, without any ornamentation, and to be thoroughly fire-proof in character and provided with fire-proof shutters; the staircases to be of iron, and the

ceilings and rooms occupied by the offices only to be plastered. I have estimated for nothing of an ornamental character, but have confined myself strictly to the constructive requirements, and the necessities of a fire-proof structure. The cost of such a building I estimate at \$421,607; and the machinery, including elevators, I estimate at \$40,000 additional. It appears to me a matter of importance that the bonds, notes, and other securities, produced in the new building, should not be transmitted to the Department through the streets, and believe that it should be connected with it by a sub-way, which is perfectly feasible, and the cost of which is estimated at \$35,674, making a total of \$497,281.

The amount of space at present occupied by the Printing Department is 62,743 feet of floor space, but many branches of the Printing Department are overcrowded, and it is probable that the Printing Department would require not less than 70,000 feet, for the new building, which would leave but 11,000 feet for the files and records of the Department, which is as small an amount of space as can be properly assigned to their use for the present. I am of the opinion that it is not possible to provide accommodations for the purposes specified in your annual report, if the size of the building is reduced, and I therefore recommend that an appropriation of not less than \$500,000 be obtained for the erection of the building, furnishing the machinery, and the further construction of the sub-way.

Very respectfully,

A. B. MULLETT,
Supervising Architect.

Hon. GEO. S. BOUTWELL,
Secretary of the Treasury.

DEFICIENCY IN APPROPRIATION, MEDICAL DEPARTMENT.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

A deficiency for the Medical Department for the fiscal year ended June 30, 1872.

FEBRUARY 8, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

WAR DEPARTMENT,
Washington City, February 3, 1873.

SIR: I respectfully request that the accompanying deficiency estimate for the Medical Department, for the fiscal year ended June 30, 1872, may be submitted to the House of Representatives as early as possible.

The delay in transmitting this estimate arises from the fact that the balance on hand to the credit of the appropriation was considered sufficient to meet all demands against it; but a number of claims have been presented recently, exhausting said balance and necessitating a deficiency appropriation.

Very respectfully, your obedient servant,

WM. W. BELKNAP,
Secretary of War.

The SPEAKER of the House of Representatives.

Estimate of appropriation required for the service of the fiscal year ended June 30, 1872, by the Medical Department of the Army, to supply deficiencies in appropriations for that year.

To pay bills for medical attendance and medicines furnished by citizens to officers and men on detached service, such bills not having been presented until after the close of the fiscal year. (Appropriated, Stat. at L., vol. xvi, p. 523, sec. 1)..... \$8,000

J. K. BARNES,
Surgeon-General, United States Army.

SURGEON-GENERAL'S OFFICE, February 1, 1873.

THE
OFFICE OF THE
LIBRARY OF THE
CONGRESS

1877

THE LIBRARY OF THE CONGRESS

OF THE
UNITED STATES OF AMERICA
WASHINGTON
1877

THE LIBRARY OF THE CONGRESS
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WASHINGTON
1877

CLERKS IN TREASURY DEPARTMENT APPOINTED IN 1872.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

A list of clerks and employes now in his Department who were appointed for duty in the city of Washington during the year 1872.

FEBRUARY 8, 1873.—Referred to the Committee on Civil Service and ordered to be printed.

TREASURY DEPARTMENT, *February 4, 1873.*

SIR: In compliance with a resolution of the House of Representatives passed January 18, 1873, I have the honor to transmit herewith a list of clerks and employes now in this Department who were appointed for duty in the city of Washington during the year 1872.

I am, very respectfully,

GEO. S. BOUTWELL,
Secretary.

Hon. JAS. G. BLAINE,
Speaker of the House of Representatives.

Clerks and employes now in the Treasury Department who were appointed for duty in the city of Washington, D. C., during the year 1872, as called for by a resolution of the House of Representatives passed January 18, 1873.

Names.	Class.	Office.	State.	Remarks.
E. S. Pollock	First	First Auditor's	Pennsylvania .	Appointed prior to the adoption of the civil-service rules.
John Walker	do	Second Auditor's	Illinois	Do.
W. W. Peake	do	do	South Carolina.	Do.
Newton DeForrest	do	do	Kansas	Do.
Albert C. Patterson	do	Secretary's	Dist. Columbia.	Do.
William H. Doolittle	do	First Auditor's	Minnesota	Do.
C. F. Whiteley	do	Second Auditor's	Georgia	Do.
Henry S. Merrill	do	Secretary's	Massachusetts.	Do.
Elias Mann	do	Second Auditor's	Ohio	Do.
J. Godfrey	do	do	Alabama	Do.
M. B. W. Hough	do	Treasurer's	New York	Do.
M. W. Moore	do	Third Auditor's	North Carolina.	Do.
M. C. Bayles	do	Comptroller Currency.	Tennessee	Do.
Isaac N. Martin	do	Secretary's	Indiana	Do.

2 CLERKS IN TREASURY DEPARTMENT APPOINTED IN 1872.

Clerks and employes in the Treasury Department, &c.—Continued.

Names.	Class.	Office.	State.	Remarks.
J. E. Collins	First	Second Auditor's	South Carolina.	Appointed prior to the adoption of the civil-service rules.
George W. C. Waite	do	do	Louisiana	Do.
George E. Johnson	do	do	Dist. Columbia	Do.
John T. Arms	do	do	New York	Do.
W. H. Nettle	do	First Comptroller	Ohio	Do.
Samuel S. Gardner	do	Second Auditor's	Alabama	Do.
Joseph L. Enderle	do	Secretary's	Massachusetts	Do.
Walter S. Eaton	do	do	do	Do.
William W. White	do	do	Kansas	Do.
George H. Wilcox	do	Sixth Auditor's	Alabama	Do.
W. N. Hughes	do	Secretary's	Tennessee	Do.
George A. Dalton	do	Second Auditor's	Arkansas	Do.
Paul Brown	do	Fourth Auditor's	Michigan	Do.
W. N. Reed	do	Sixth Auditor's	Wisconsin	Do.
George A. Shaw	do	Second Auditor's	Maine	Do.
J. E. Reynolds	do	Treasurer's	New York	Do.
William H. Larner	do	Secretary's	do	Appointed under civil-service rules.
George N. Lamphere	do	do	Connecticut	Do.
James A. Babson	do	do	Maine	Do.
George Y. Coffin	do	do	Dist. Columbia.	Do.
Mrs. Margaret R. Grey	do	Sixth Auditor's	Massachusetts	Do.
Albert L. Smith	do	do	New York	Do.
John T. Clokey	do	do	Dist. Columbia.	Do.
P. T. Hoover	do	do	Pennsylvania	Do.
M. T. Jefferies	do	do	do	Do.
M. L. Muhleman	do	do	Missouri	Do.
John T. Coughlin	do	do	Maryland	Do.
W. K. McCoy	do	Comptroller Currency	do	Do.
Richard R. Branner	do	Treasurer's	Dist. Columbia.	Do.
J. F. Patterson	do	Sixth Auditor's	New York	Do.
John R. Williamson	do	do	Dist. Columbia.	Do.
Ezra B. Bell	do	do	N. Hampshire	Do.
C. H. Luff	do	Second Auditor's	Dist. Columbia.	Do.
Bernard P. Mimmack	do	do	New York	Do.
Pliny J. Locke	do	do	Pennsylvania	Do.
A. H. Girard	do	Bureau Statistics	South Carolina.	Do.
Calvin E. Town	do	First Auditor's	New York	Do.
Adolph Van Renth	do	Second Auditor's	Maryland	Do.
Henry C. Wise	do	do	Ohio	Do.
Eugene C. Adams	do	First Auditor's	Dist. Columbia.	Do.
Frank C. Severance	do	Fourth Auditor's	Illinois	Do.
L. A. F. Harvard	do	Register's	Dist. Columbia.	Do.
James J. Furman	do	Second Auditor's	Pennsylvania	Do.
John H. Carnianck	do	do	New York	Do.
John W. Reid	do	do	Ohio	Do.
Charles M. B. Harris	do	Sixth Auditor's	Maryland	Do.
David H. Lamb	do	Second Auditor's	Pennsylvania	Do.
Miss Georgia F. Snow	do	Fourth Auditor's	Michigan	Do.
David B. Ventres	do	Comptroller Currency	New York	Do.
Henry G. Ayer	do	Secretary's	N. Hampshire	Do.
Richard N. Saunders	do	Bureau Statistics	Dist. Columbia.	Do.
Miss Jessie J. Brown	do	Secretary's	Florida	Do.
John W. Cromwell	do	Sixth Auditor's	Virginia	Do.
James P. DeMattos	do	Second Auditor's	Illinois	Do.
Miss Love L. Bursley	do	Comptroller Currency	Dist. Columbia.	Do.
Oscar Oldberg	do	Bureau of Statistics	Tennessee	Excepted from operations of civil-service rules.
William Elder	Fourth	Comptroller Currency	Pennsylvania	Appointed by order of the President.
Mrs. S. L. Reeve	\$900	Treasurer's	Michigan	Appointed prior to the adoption of civil-service rules.
Miss Mollie House	900	do	Dist. Columbia	Do.
Mrs. Nancie N. Maguire	900	do	Virginia	Do.
Miss Cath. L. Perkins	900	do	Dist. Columbia	Do.
Mrs. Mary F. Emerson	900	do	do	Do.
Mrs. Mary J. Davidson	900	do	South Carolina	Do.
Miss Minna Seibert	900	do	Dist. Columbia	Do.
Mrs. M. A. Durand	900	do	do	Do.
Miss Hattie Outkelt	900	do	Illinois	Do.
Mrs. Susan J. Snyder	900	do	Dist. Columbia	Do.
Miss Hattie Bartlett	900	do	Maine	Do.
Mrs. Kate L. Usher	900	do	Massachusetts	Do.
Miss Kate A. Dickins	900	do	Dist. Columbia	Do.
Miss A. A. Vernon	900	Internal Revenue	Rhode Island	Do.
Mrs. Mary A. Ripley	900	Treasurer's	Dist. Columbia	Do.
Miss S. M. Cartwright	900	do	do	Do.

Clerks and employes in the Treasury Department, &c.—Continued.

Names.	Class.	Office.	State.	Remarks.
Mrs. Kate P. Fuller	\$900	Treasurer's	South Carolina	Appointed prior to the adoption of civil-service rules.
Mrs. A. L. Campbell	900	do	Dist. Columbia	Do.
Miss Sarah E. Martin	900	do	do	Do.
Mrs. M. E. Meem	900	do	do	Do.
Mrs. M. St. Albe	900	do	do	Do.
Mrs. A. Schoenecker	900	do	New York	Do.
Le Roy Livingston	Laborer	Comptroller Currency	Minnesota	
James D. Burke	do	do	North Carolina	
Richard W. Davidge	Watch	Department	Massachusetts	
Miss L. E. Banning	\$900	Internal Revenue	New York	Do.
Mrs. L. P. Tyndale	900	do	Illinois	Do.
Miss Anna B. Stapler	900	do	Delaware	Do.
Mrs. Anna R. Hull	900	do	Virginia	Do.
Mrs. Rebecca Michener	900	Register's	Dist. Columbia	Do.
Miss H. B. Hine	900	do	Ohio	Do.
Miss E. H. Stanton	900	do	Virginia	Do.
Miss E. M. Hardie	900	Treasurer's	New York	Do.
Wm. E. Waggener	Laborer	Sixth Auditor's	West Virginia	
John C. Ferguson	do	do	Dist. Columbia	
William Lewis	Ass't messenger.	Second Auditor's	Maine	
John Brown	do	Treasurer's	Dist. Columbia	
Dennis Leary	Laborer	do		
H. B. Hughes	Messenger	Comptroller Currency	Pennsylvania	
Mrs. P. McL. Pride	\$900	First Comptroller's	South Carolina	Appointed prior to the adoption of civil-service rules.
Miss E. Winters	900	Treasurer's	Alabama	Do.
Mrs. H. E. Summons	900	do	Maine	Do.
Miss Sarah Kearney	900	do	Dist. Columbia	Do.
Mrs. Maggie Roe	900	do	do	Do.
Mrs. H. M. Smith	900	Third Auditor's	Connecticut	Do.
Miss Jennie Snowden	900	Sixth Auditor's	New Jersey	Do.
David C. Yingling	Watch	Department	Pennsylvania	
Miss Mary Collins	\$50 p'r month	Treasurer's	Ohio	
Alexander B. Cummings	Laborer	Sixth Auditor's	Pennsylvania	
Calvin R. Nutt	do	Secretary's	Dist. Columbia	
George C. Flenner	Ass't messenger.	Register's	do	
Miss S. M. Morris	\$36 p'r month	Treasurer's	do	
Gilbert Gray	Laborer	Internal Revenue	do	
Willie Harris	Messenger	Treasurer's	do	
Clément Herbert	Fireman	Department	do	
Mrs. A. E. Dukehart	\$20 p'r month	Secretary's	do	
Henry Lyons	Laborer	do	do	
Mrs. Annie E. Gross	Ass't messenger.	Treasurer's	Pennsylvania	
Mark Evans	Laborer	do	Dist. Columbia	
Miss Mary Trenis	\$36 p'r month	do	do	
Robert Calvert	Laborer	Internal Revenue	do	
George W. Alexander	do	do	do	
Lewis Burns	do	Register's	do	
B. F. Dabney	Fireman	Department	do	
Mrs. Mary Daley	\$15 p'r month	Secretary's	do	
Julia R. Donoho	Messenger	Comptroller Currency	Mississippi	
Charles C. Theaker	Watch	Department	Dist. Columbia	
Miss V. Bates	\$36 p'r month	Treasurer's	do	
Richard Bennett	Watch	Department	N. Hampshire	
Moses Wood	Fireman	do	Dist. Columbia	
Mrs. H. Rolle	\$900	Treasurer's	Dist. Columbia	Appointed prior to the adoption of the civil-service rules.
Mrs. Mary C. Davies	900	Internal Revenue	do	Do.
Mrs. Fannie J. Cox	900	Register's	Pennsylvania	Do.
Miss Ada C. Sweet	900	Internal Revenue	Illinois	Do.
Miss Harriet C. Root	900	Secretary's	Ohio	Do.
Miss Lizzie W. Rogers	900	Treasurer's	Pennsylvania	Do.
Mrs. E. Timberlake	600	do	Dist. Columbia	
David House	Watchman	Department		
G. B. Anderson	Laborer	Internal Revenue	Virginia	
James F. Jackson	do	Department	Dist. Columbia	
Mrs. Bettie Peters	\$600	Treasurer's	do	
Mrs. Mary Dangerfield	\$15 per month	Secretary's	do	
Irwin B. Linton	Laborer	Register's	do	
W. F. White	do	Third Auditor's	North Carolina	
Miss Annie Ghant	\$36 per month	Treasurer's	Dist. Columbia	
A. B. Baker	Watch	Department	Maine	

4 CLERKS IN TREASURY DEPARTMENT APPOINTED IN 1872.

Clerks and employes in the Treasury Department, &c.—Continued.

Names.	Class.	Office.	State.	Remarks.
Miss Lillie Kingsley	\$900	Secretary's	Vermont	Appointed prior to the adoption of the civil-service rules.
Miss Louise Hodges	900	Sixth Auditor's	Maine	Do.
Mrs. Harriet C. Carr	900	Comptroller Currency	do	Do.
Mrs. Mary Phillips	900	Third Auditor's	Mississippi	Do.
Miss Martha N. Hooper	900	Sixth Auditor's	Massachusetts	Do.
Mrs. Mary Wilson	\$36 per month	Treasurer's	Dist. Columbia.	
Charles B. Hinckley	Laborer	Comptroller Currency	Louisiana	
A. C. Luther	Watch	Department	Wisconsin	
Benjamin F. Thompson	Fireman	do	Virginia	
Mrs. A. M. Faeltz	Messenger	Secretary's	Pennsylvania	
B. C. Sommerville	Laborer	First Auditor's	Dist. Columbia.	
Mrs. A. E. Gould	Messenger	Secretary's	New York	
Stephen D. Skeen	Laborer	Department	Pennsylvania	
Mrs. Margaret Grant	\$15 per month	Secretary's	Dist. Columbia.	
Mrs. Martha Marshall	\$20 per month	do	do	
Henry C. Megrew	Laborer	Internal Revenue	do	
Walter T. Ramsdell	do	do	Illinois	
Oliver White	Fireman	Department	Minnesota	
Edwin Fawcett	Laborer	Fourth Auditor's	Dist. Columbia.	
Mrs. Eliza J. Claxton	Messenger	First Comptroller's	do	
Henry Mathews	Laborer	Comptroller Currency	do	
George W. Bryan	Watchman	Department	Ohio	
Henry Hopkins	Laborer	Second Auditor's	Dist. Columbia.	
David Force	Messenger	do	Pennsylvania	
Addison A. Hossan	Laborer	Secretary's	do	
George C. Kent	Ass't mess'r.	Second Auditor's	Dist. Columbia.	
W. H. Howe	Laborer	Third Auditor's	North Carolina.	
John G. Marshall	do	Customs	Pennsylvania	
Joseph R. Crozet	do	Secretary's	do	
Edward O'Connor	Watchman	Department	Dist. Columbia.	
William H. Romaine	Laborer	do	do	
Joseph A. Stevens	do	do	Maryland	
John Stewart	do	Register's	Dist. Columbia.	
William C. Harbin	do	Secretary's	do	
Frank S. Brewer	Ass't mess'r.	Register's	do	
M. Gonzales	Watchman	Department	do	
Anderson Hill	do	do	Tennessee	
David H. Logan	do	do	Pennsylvania	
George McGoins	do	do	Dist. Columbia.	
Henry M. Higbee	Laborer	Internal Revenue	Wisconsin	
Benjamin W. Hunter	do	Secretary's	Virginia	
James M. Gassaway	do	do	Dist. Columbia.	
Frank B. Morse	do	do	Massachusetts.	
Thomas J. Goodwin	do	Sixth Auditor's	Dist. Columbia.	

CLERKS EMPLOYED IN ATTORNEY-GENERAL'S DEPARTMENT.

LETTER

FROM

THE ATTORNEY-GENERAL,

RELATIVE TO

The number of clerks and employés in his Department during the year 1872.

FEBRUARY 8, 1873.—Referred to the Committee on the Re-organization of the Civil Service of the Government and ordered to be printed.

DEPARTMENT OF JUSTICE,
Washington, February 3, 1873.

SIR: I have the honor to acknowledge the receipt of a resolution of the House of Representatives, dated the 8th ultimo, in the following words:

Resolved, That the Secretaries of State, Treasury, Interior, War, and Navy, and the Attorney-General and Postmaster-General, be requested to inform this House how many clerks and employés in their respective Departments have been appointed for employment in the city of Washington during the year 1872; and also to furnish the names of said appointees, and the States from whence appointed. They are further requested to designate those who were appointed under the civil-service rules.

In compliance with this resolution, I submit the following statement of the clerks and employés appointed by this Department for employment in this city during the year 1872:

Henry O'Connor, appointed February 9, 1872, as examiner of claims in the Department of State. The appointments to this office are not included in the operation of the civil-service rules.

W. C. Tripler, appointed January 15, 1872, as translator for the Mexican claims commission, at a salary of \$1,500 per annum.

George C. Wing, of Ohio, appointed March 8, 1872, to a temporary clerkship in the office of the Solicitor of the Treasury.

Palmer Tilton, of the District of Columbia, appointed March 16, 1872, to a temporary clerkship in the office of the Solicitor of the Treasury.

C. A. Vedder, of the District of Columbia, appointed April 10, 1872, to a temporary clerkship in the office of the Attorney-General; since removed.

R. W. Spain, of Nebraska, and William Lane, of Maryland, appointed July 1, 1872, as watchmen in this Department.

2 CLERKS EMPLOYED IN ATTORNEY-GENERAL'S DEPARTMENT.

Charles Bull, of South Carolina, appointed July 3, 1872, to a temporary clerkship in the office of the Attorney-General.

George Wainscott, of Kentucky, appointed October 14, 1872, to a temporary clerkship in the office of the Attorney-General.

The appointment of examiner of claims being exempt from the operation of the civil-service rules, and the other appointments being merely temporary, no occasion has arisen for the application of those rules.

Very respectfully,

GEO. H. WILLIAMS,
Attorney-General.

Hon. JAMES G. BLAINE,
Speaker of the House of Representatives.

UTAH INDIAN WAR CLAIMS.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

*The claim of the Territory of Utah for Indian war expenses of the years
1865, 1866, and 1867.*

FEBRUARY 8, 1873.—Referred to the Committee on Indian Affairs and ordered to be
printed.

WAR DEPARTMENT,
February 6, 1873.

The Secretary of War has the honor to report to the House of Representatives, for the information of the Committee on Military Affairs, in reply to the request of said committee of the 28th ultimo, for information in regard to the claim of the Territory of Utah for Indian war expenses of the years 1865, 1866, and 1867, that the only record of this class of troops is embraced in a letter of Hon. J. M. Ashley, dated May 3, 1865, introducing one S. T. Hauser, the bearer of a letter from the governor of Utah, who desired to raise one or more regiments of mounted men for defense against the Indians.

The request of Mr. Hauser for authority to raise the organizations referred to does not appear to have been granted, the letter of introduction, brought by him with other papers, having been filed without action.

It appears, however, that troops were raised by the governor of Utah, inasmuch as, February 9, 1869, the adjutant-general of Utah forwarded a statement of expenses incurred by the Territory in its defense. The statement was received at the War Department March 25, 1869, and transmitted to the House of Representatives the same date. Nothing further appears on the records of this Department. There may be papers in the claim in the office of the Third Auditor of the Treasury.

WM. W. BELKNAP,
Secretary of War.

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MISSISSIPPI CHIPPEWA INDIANS.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

RELATIVE TO

*An appropriation for the relief of the Mississippi Chippewa Indians on the
White Earth reservation.*

FEBRUARY 8, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., January 30, 1873.

SIR: I have the honor to inclose herewith, first, two letters, dated January 6, 1872, addressed to the Commissioner of Indian Affairs by the chiefs of the Mississippi Chippewas on the White Earth reservation; secondly, two letters, dated the 27th instant, addressed to the Secretary of the Interior by the Right Rev. H. B. Whipple, of the Episcopal Church, who has, for a long time, taken a deep interest in the protection and welfare of these Indians.

The destitute condition of these Indians, disclosed by the papers herewith, calls for prompt action and immediate relief. It is needless to call the attention of Congress to the necessity for such action and relief in any other terms than those contained in these letters.

I beg, therefore, to recommend, first, an appropriation of \$25,000 for immediate use, in preventing starvation and other suffering by this tribe of Indians; and, secondly, the passage of a law authorizing these Indians to sell a township of land to the United States for the sole use of the Pembina Chippewas, (the subject of which was embraced in a letter addressed by this Department to the Speaker of the House on the 13th instant,) and from the proceeds of such sale to re-imburse the Government for the \$25,000 to be immediately appropriated. I cannot too earnestly direct the attention of Congress to the necessity for the immediate passage of the two propositions herein indicated, or some equivalent therefor.

This communication I have forwarded to the House by the hand of

Agent E. P. Smith, in charge of these Chippewas, who will be able to give the Committee on Appropriations, or any other committee to whom this letter may be referred, any other information which may be required upon this subject.

The papers, herewith inclosed, having been referred to the Acting Commissioner of Indian Affairs for his views, I now transmit a copy of his report dated to-day, in which he urges the same measures as have been previously indicated in this letter.

Very respectfully, your obedient servant,

C. DELANO,
Secretary.

The Hon. the SPEAKER of the House of Representatives.

WHITE EARTH, MINNESOTA, *January 6, 1873.*

SIRS: We feel that we are going to pass a hard winter, and many will begin their suffering in a few days. Our supply of provisions which we gathered last fall by fishing and hunting, and making rice, is very near exhausted, and when that is gone, what are we to do? We asked our agent in council the other day if he could help us any in the way of provision; he told us he could not, and had no work for us to do, and no means in his hands to assist us in any way except by a surplus of annuity-money from last fall's payment, which would amount probably to \$1 per head, and which we would get toward spring; if we had that dollar now, it is not supposed we could live two or three months on it; a white man may probably get along with it, but an Indian could not. What are we to do? Our agent cannot help us, and the traders cannot feed us for nothing; they have given us a great deal on credit, and as soon as they stop doing so, we shall have nothing to depend upon. To whom, then, shall we look upon for relief but to you who may have pity on us in our present condition? If this starvation which is staring us was caused by laziness or mismanagement of domestic affairs, we would be ashamed to ask for aid after so much has been done by your religious societies. You are, I suppose, aware that our crops were entirely destroyed by the grasshoppers in the month of July last, and we have no means in advance like the white man whom we are trying to imitate. We fear we shall be obliged to turn heathen again, as far as our provisions are concerned, for a short time, for it is not expected that any person will let his children suffer when he has a yoke of oxen in his possession; although we know we will do wrong in killing them, as it will enable us to do our planting next spring, and we are certain our agent will not give any more. No one knows the extent of suffering there will be, and when known in full it may be too late for some of us. Some of our good people on this reservation do not believe there will be much suffering; no one will believe when he himself will sit at his table full of luxuries, but let some of our Christian friends go round to our huts and see what we eat, how much we have to eat, and they may be able to pass their opinion more correctly on us.

We remain, yours, friends and brothers,

WAUB-AUN-AU-QUOD. +
ME-SHA-KE-KI-SHICK. +
MEN-E-DO-WAU-BE. +
NAY-BAN-A-SKUNG. +

In presence of—

C. H. BEAULIEU.

J. J. ENMEGAHBOOH.

The INDIAN COMMISSIONERS.

WHITE EARTH, MINNESOTA, *January 6, 1873.*

SIR: In a council we had with our agent, Major E. P. Smith, he asked us if we would permit the Chippewas of Pembina to come on our reservation. We have talked the matter over with other chiefs of our band, and we feel sorry for our friends and relatives who reserved no homes when they ceded their land to their Great Father. They are now like birds flying from tree to tree, but finding no spot they can call their permanent homes.

If the Chippewas of Mississippi were as rich in lands as they used to be in former times, we would willingly invite them to come and make their homes with us, without recompense; but we are too poor, for many of us, as well as other new-comers, have but a little to start with to commence a new mode of life, and many have nothing at all with which they would be enabled to help them; neither do we see anything to continue this way of living which our Great Father has laid out for us, unless it is by the generosity of Congress, which has not forsaken us up to the present time, and may again extend a helping hand, which might be used for the other Mississippi bands which expect to join us next summer. We have, therefore, agreed that we will sell a certain tract of land on this reservation to our Great Father, which our agent and the chiefs shall designate hereafter, for a home for the Pembina Indians, or any other Chippewas, (but for no other tribe or nation,) and the money which our Great Father will give us be used as our agent and the chiefs may agree upon in council, for the benefit of the Chippewas of Mississippi on this reservation, who have made their homes here at the present time.

Respectfully, yours,

WAUB-AUN-AN-QUOD, his x mark,
Chief.
 MSHA-KE-KE-SHICK, his x mark,
Chief.
 MEN-E-DO-WUBE, his x mark,
Chief.
 NAY-BUN-A-SKUNG, his x mark,
Chief.

In presence of—

C. H. BEAULIEU,
 J. J. EMMIGABAUH.

The Hon. COMMISSIONER OF INDIAN AFFAIRS,
Washington, D. C.

ROME, NEW YORK, *January 27, 1873.*

MY DEAR SIR: Inclosed I send you a letter of the chiefs of the White Earth Indians. If the proposal was to sell any portion of this reservation to whites, I would oppose it. These Indians have sold us land worth millions, and they have been robbed as few Indians ever have been. This reservation ought to be the home of all of the Chippewas, and if by the sale of any part of this for others to come, or by appropriations, this end can be carried out, I believe great good could be done. I am sure you will do all you can for these people, only I beg of you to set your face as a flint against the sale of one foot of this reservation to whites. The Indians would only get a pittance, and Ahab repeat the robbery of Naboth.

God bless you and reward you for all your heroic efforts for this helpless race. Does not Christ our King look down and see all such blessed work? And will not He repay it?

Your friend,

H. B. WHIPPLE.

Hon. Mr. DELANO,
Secretary of the Interior.

POST-OFFICE, FARIBAULT, MINNESOTA,
January 27, 1873.

MY DEAR FRIEND: The letter which I mark No. 2 tells its own sad story. These men are our friends. They have always been true to their plighted faith. They are now living as white men. They are Christians. It will be an awful blot on the nation if they are allowed to starve. They had planted large crops, and early in June these crops looked well, and every heart was glad.

In July there came a grasshopper plague, which destroyed every vestige of their labor. They did the best they could to gather rice and fish, but now starvation stares them in the face. You must aid them. If their agent is in Washington please show him this letter. I have no means, or I would at once provide for them. The letter only reached me to-day, on account of our severe storm. I have telegraphed one of my clergy to buy five hundred dollars' worth of provisions, for which I will be responsible.

Assuring you of my deep gratitude for all your efforts for this poor race,

I am your friend,

H. B. WHIPPLE.

Hon. SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., January 30, 1873.

SIR: I have the honor to return, herewith, the letters of Rev. H. B. Whipple, of January 27, 1873, with inclosures, this day referred to this Office by the Department, relative to the destitute condition of the Chippewas on the White Earth reservation, and would respectfully recommend that Congress be asked to appropriate \$25,000 for their relief.

In this connection I would respectfully invite attention to the matter of the sale, by said Indians, of a township of their land, which was submitted to Congress with letter of the Department of 13th instant. Should such sale be authorized, the \$25,000 could be re-imbursed to the Government from the proceeds of such sale.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

Hon. C. DELANO,
Secretary of the Interior.

SITE OF FORT HOUSTON, NASHVILLE, TENNESSEE.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A draught of a bill to confirm the purchase of a portion of the site of Fort Houston, at Nashville, Tennessee, and to provide for the sale of the same; also to confirm the purchase of certain land at Fort Hamilton, New York.

FEBRUARY 8, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT, *February 6, 1873.*

The Secretary of War has the honor to transmit to the House of Representatives a draught of an act to confirm the purchase, on the 25th of August, 1865, of a portion of the site of Fort Houston, at Nashville, Tennessee, and to provide for the sale of the same, the land being no longer necessary for military purposes; also to confirm the purchase, on the 9th September, 1862, of certain land at Fort Hamilton, New York, upon which batteries are now erected.

The passage of this act at the present session of Congress is respectfully recommended, in order that the officer by whom the property referred to was purchased may be relieved from further accountability, the expenditures having been disallowed by the Third Auditor of the Treasury on settlement of his accounts, and he informed that he must apply to Congress for relief.

WM. W. BELKNAP,
Secretary of War.

AN ACT to confirm the purchase of a portion of the site of Fort Houston, at Nashville, Tennessee, and to provide for the sale of the same; also to confirm the purchase of certain land at Fort Hamilton, New York.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the purchase by the United States on the 21st day of August, 1865, from Russell Houston, of certain land consisting of about three and one-quarter acres, situate in the city

of Nashville, Tennessee, with the buildings thereon standing, and being the same premises described in a deed of said date from said Houston to the Chief Engineer of the Army in trust for the United States, recorded in Book 35, page 241, in the register's office of Davidson County, Tennessee, be and the same hereby is ratified, sanctioned, and confirmed, so that the said purchase, and the said deed thereupon executed, shall have the same legal validity and effect as if the same had been by a previous act of Congress specifically authorized.

SEC. 2. *And be it further enacted*, That the Secretary of War be, and he hereby is, authorized to sell at public auction to the highest bidder, either in entirety or in portions, and after thirty days' notice in two daily newspapers published in the city of Nashville, the land described in the preceding section; the same having lately formed a portion of the site of Fort Houston, and having become no longer necessary for military purposes; and that the proceeds of such sale shall be paid into the Treasury of the United States.

SEC. 3. *And be it further enacted*, That the purchase, by order of the Executive Department, under an authority supposed to be conferred by the act of February 20, 1862, making appropriations for the construction, &c., of certain fortifications, &c., of certain land at Fort Hamilton, New York, consisting of about twenty-one acres, as a site for additional batteries, and conveyed to the United States by deed of Julia Delaplaine of September 9, 1862, which said deed has been pronounced by the Attorney-General, by opinion of November 22, 1862, to vest a good and valid title in the United States, and upon which said land the said batteries have been duly constructed, be, and the same hereby is, confirmed.

FORT SANDERS MILITARY RESERVATION.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The reduction of the Fort Sanders military reservation.

FEBRUARY 8, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT, *February 5, 1873.*

The Secretary of War has the honor to transmit to the House of Representatives, for the information of the Committee on Military Affairs, a copy of the report of the Adjutant-General of the Army relative to a reduction of the Fort Sanders military reservation.

WM. W. BELKNAP,
Secretary of War.

Report relative to a proposed reduction of the Fort Sanders military reservation, Wyoming Territory.

An enlargement of this reservation was declared by the President June 28, 1869, and the reserve, at present, contains an area of eighty-one square miles—nine miles square. Its limits embrace the site of the town of Laramie, and also the territorial penitentiary grounds, permission for the location of the latter having been granted at request of the Interior Department.

In December, 1871, the House Committee on Military Affairs referred to the War Department draught of a bill for a reduction of the reserve, and reference being made to General Sheridan, he expressed the opinion that a reservation of four square miles would be sufficient for the post, and it seems a report in accordance with this view was made by the War Department to the House Committee, and that accordingly an act (H. R. 161) passed the House March 1, 1872, (which was read twice in the Senate and referred to the Committee on Military Affairs,) reducing the reserve to four square miles, and designating the boundaries as reduced. *It does not appear that this bill has yet become a law.*

January 1, 1873, the post commander (evidently in answer to a com-

munication from division headquarters on the subject) states that he has had the reservation carefully examined, with a view to its reduction, and has concluded that it is essential to retain only such of the reservation as will be absolutely necessary to furnish hay and wood, and a supply of water for the post. He incloses a plat showing the present bounds of the reserve, and indicates in red lines a proposed reduction, which he states will diminish the reservation about one-half, and yet secure the land needed for the post, while at the same time it will do no injustice to settlers. He mentions a Mr. Davidson as having within a few months settled on hay-ground actually required for the post. From the plat forwarded it appears that Mr. Davidson and two or three others have ranches partially within the proposed reduced limits.

The post commander further says that it will be necessary to reserve, in addition, the whole of what is known as the Government Cañon, in order to supply the necessary wood. Referring to the House bill making a reduction, he remarks that should the same become a law, with boundaries given in the bill, the post would be without a particle of wood, water, or hay, and he thinks it would be better to break up the post immediately.

The department commander approves of a reduction, as indicated by the post commander, and requests that legislation to that end be asked. Approved by division commander and by the General of the Army.

The change recommended appears to exclude Laramie City and the penitentiary grounds, and to embrace the tract known as the Government Cañon, which latter does not seem to have been included in reservations heretofore declared. This would, therefore, require an executive order for its reservation, while the proposed reduction of the post reserve can only be made with the sanction of Congress.

E. D. TOWNSEND,
Adjutant-General.

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MILITARY TELEGRAPH LINE IN TEXAS.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The establishment of a military telegraph line in Texas.

FEBRUARY 8, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT, *February 6, 1873.*

The Secretary of War has the honor to transmit to the House of Representatives, for the information of the Committee on Military Affairs, the inclosed copy of a telegram from Brigadier-General C. C. Augur, urging the establishment of a military telegraph line in Texas.

WM. W. BELKNAP,
Secretary of War.

[The Western Union Telegraph Company. Dated San Antonio, Texas, January, 29, 1873.]

To General W. T. SHERMAN :

Will you do what you can to have telegraph established to our posts here? General Sheridan will report strongly in favor, being important.

C. C. AUGUR,
Brigadier-General.

HEADQUARTERS OF THE ARMY,
Washington, D. C., January 31, 1873.

Official copy, respectfully submitted for the information of the Hon. Secretary of War.

W. T. SHERMAN,
General.

[Indorsement.]

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, February 1, 1873.

Respectfully submitted to the Secretary of War.

E. D. TOWNSEND,
Adjutant-General.

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ROAD FROM SANTA FÉ TO TAOS.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The proposed road from Santa Fé to Taos, in the Territory of New Mexico.

FEBRUARY 8, 1873.—Referred to the Committee on Military Affairs and ordered to be printed, to accompany bill H. R. 2747.

WAR DEPARTMENT, *February 6, 1873.*

The Secretary of War has the honor to report to the House of Representatives, for the information of the Committee on Military Affairs, that the proposed road (bill H. R. 2747) from Santa Fé to Taos, in the Territory of New Mexico, it is believed, will be of advantage to the United States in the improved communication between Santa Fé (the headquarters of the military forces in New Mexico) and Fort Garland, via the large town of Taos.

This road would be the one traveled by paymasters and other officers and troops, and used in transportation of supplies between Santa Fé and Fort Garland, instead of the very rough road and trails which must now be passed over. (See chap. 79, vol. 10, Stat., page 303.)

WM. M. BELKNAP,
Secretary of War.

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COTTON-TAX.

L E T T E R

FROM

THE SECRETARY OF THE TREASURY,

RELATIVE TO

The propriety of refunding the cotton-tax.

FEBRUARY 8, 1873.—Referred to the Committee of Ways and Means and ordered to be printed.

TREASURY DEPARTMENT,
Office of the Secretary, February 4, 1873.

SIR: As required by a resolution of the House of Representatives of the 1st instant, I have the honor to transmit to the House an argument in writing, prepared in the Office of the Commissioner of Internal Revenue, by Mr. Israel Kimball, in relation to the propriety of refunding the cotton-tax.

Very respectfully,

GEO. S. BOUTWELL,
Secretary.

Hon. JAMES G. BLAINE,
Speaker House of Representatives.

OUGHT THE TAX COLLECTED ON RAW COTTON UNDER
THE INTERNAL-REVENUE LAW TO BE REFUNDED?

As this question is being very generally discussed throughout the country, in the public journals and in the halls of Congress, and inasmuch as the question is one of personal interest to every tax-payer in the country, involving the payment from the United States Treasury of nearly seventy millions of dollars, every one is interested to know on what grounds such a claim is made. We are told in the newspapers that the southern members of Congress of both parties have, to a man, declared in favor of the refunding of this tax; that they have submitted a memorial, numerous signed and addressed personally to each member of the House of Representatives, accompanied with memorials from State legislatures and arguments of distinguished counsel, in which the correctness and propriety of refunding to the citizens of the cotton States

the tax collected by the general Government on raw cotton, is demonstrated.

The ground on which the advocates of this measure base their claim is, that the tax was unconstitutional:

1. Because not uniform; and,
2. Because it was a tax levied upon exports.

Again, it is claimed that the tax was unequal and oppressive in its operations:

1. Because it fell entirely upon producers;
2. Because it was imposed without the consent of the southern people, and when they were wholly unrepresented; and,
3. Because the producers of cotton paid the same taxes that all other citizens paid, and the extra cotton-tax levied on no others.

I propose to examine these several points in the order named above, and to show as well as I can the fallacy of the reasons urged in favor of refunding the cotton-tax, and why the Government ought not to refund it.

Under the Constitution of the United States the first of the legislative powers conferred on Congress relates to the laying and collecting of taxes. The first clause of the eighth section of the first article is in these words:

Congress shall have power to lay and collect taxes, duties, imposts, and excises, to pay the debts and provide for the common defense and general welfare of the United States.

No limit can be found in this clause to the objects and sources of taxation. In this respect the power granted to Congress is general. It may lay and collect taxes on lands and other real estate, and on polls, which are known under the head of direct taxes. It may lay them on articles which enter into consumption, and of which each person pays only so much as he consumes of such articles. It may lay impost taxes or duties, making the same uniform on all imports, or discriminating as to particular articles. It may levy excise taxes, having the choice to impose them on agricultural products, or products of the mines, or manufactures. In its choice of objects to be made the subjects of taxation no limit is imposed by the section I have quoted upon the power of Congress. To any extent demanded by the exigencies of the Government, for the purposes specified, viz, to pay the public debt, to provide for the common defense and general welfare of the United States, Congress has power to levy and collect taxes, duties, imposts, and excises.

The absolute necessity of this power of taxation conferred by the fundamental law of the nation on its legislature seems to be a proposition too plain to require argument. In the language of Judge Story, "if there is to be an effective National Government, there must be a power of taxation given to it adequate to its wants, its objects, and its duties."

On the 1st day of July, 1862, Congress passed an act entitled "An act to provide internal revenue to support the Government and to pay interest on the public debt." At that time eleven States of the Union, including all of the so-called cotton States, were in insurrection and rebellion, and carrying on war against the United States. To put down this rebellion, to restore the Union, to re-establish justice and tranquility, and to perpetuate the blessings of civil liberty, Congress had, in the exercise of other powers conferred upon it by the Constitution, viz, the power "to raise and support armies," "to provide and maintain a navy," and "to provide for calling forth the militia to execute the laws of the Union, suppress insurrections, and repel invasions," called out,

armed, and equipped large land and naval forces. To provide for these forces and to maintain them in the field internal taxation had to be resorted to. To meet these expenses of the Government, the receipts from the ordinary sources of taxation, viz, from imposts, proved to be but as a drop in the bucket. To borrow money on the credit of the United States, though legitimate and within the delegated powers of Congress, was a resource entirely inadequate to meet the pressing exigencies of the times. The credit of the Government at that crisis was too low to warrant even an attempt to borrow money from foreign capitalists. Loans could be obtained only from our own people, the payment of which must be guaranteed by increased taxation.

Under this pressure of circumstances, after months of painful anxiety, during which, in Congress and out of Congress, the subject was discussed until it had been nearly exhausted, Congress passed the internal-revenue law before alluded to. That law, with those which were subsequently passed, including the act of March 3, 1863, of June 30, 1864, and March 3, 1865, seem to have completely exhausted the sources of taxation. Nearly all trades, occupations, and professions, and the incomes, profits, and gains derived therefrom, were made to contribute their proportion to the United States Treasury. Tax-gatherers were sent into every nook and corner of the country where the civil authority of the United States was not obstructed by reason of the before-mentioned insurrection and rebellion, to collect the taxes which Congress had levied on its industries. The duties on all foreign importations were largely increased to correspond with internal taxes. All goods, wares, and merchandise, the products of our home manufactures, were taxed. The products of our forests and of our fisheries, of our mines, of agriculture, all were made objects or sources of taxation, if not in their crude state, at their first remove from such state by any process of preparation or manufacture. For instance, a tax was imposed on all coal mined; on crude petroleum; on waters from springs impregnated with minerals, when put up and sold in bottles; on slaughtered animals; on fruits and vegetables preserved; on meats, fish, and shell-fish in air-tight packages; on all oils, animal or vegetable, with few exceptions; on salt; on turpentine; on building-stone when hewn; on copper, lead, and iron in pigs; on quicksilver; on diamonds, emeralds, and precious stones; on bullion, whether gold or silver, in lumps, ingots, or bars; on manufactured lumber; on tanned skins, not excepting goat, calf, kid, sheep, horse, hog, or dog; and on all manufactures, whether of cotton, silk, worsted, hemp, India rubber, gutta-percha, wood, leather, paper, iron, steel, lead, tin, copper, zinc, brass, gold, silver, horn, ivory, bone, bristles, wholly or in part, or of other materials. In fact, so general was taxation, either specifically and under special enumeration, or by a comprehensive and general clause, that taxation was looked upon by the revenue-officers as the rule, and exemptions the exceptions; and these exceptions were so limited that a list could almost be made of them on one's finger-ends.

To this general and almost universal rule of taxation it was not thought expedient to make cotton, which had been claimed and proclaimed to be the king of products, an exception. The act of July 1, 1862, imposed a tax of one-half of one cent per pound on cotton. The language of the statute reads as follows:

On and after the 1st day of October, 1862, there shall be levied, collected, and paid a tax of one-half of one cent per pound on all cotton held or owned by any person or persons, corporation, or association of persons; and such tax shall be a lien thereon in the possession of any person whomsoever.

The act of June 30, 1864, imposed a tax of two cents per pound on cotton. The language of the statute is as follows:

On cotton upon which no duty has been levied, and which is not exempted by law, a duty of two cents per pound, which shall be and remain a lien thereon until said duty shall have been paid, in the possession of any person or persons whomsoever.

The exemption provided for in this clause related to cotton sold by or on account of the Government of the United States, which was sold and delivered to the purchaser free of tax, and so understood between the parties at the time of sale and purchase.

The same act provided that whenever any cotton, the product of the United States, should arrive at any port of the United States from any State in insurrection against the Government, the assessor or assistant assessor should immediately assess the taxes due thereon. And the tax became a lien on the cotton from the day of such assessment.

The act of July 13, 1866, imposed a tax of 3 cents per pound on cotton. The language of the statute is as follows, to wit:

That on and after the 1st day of August, 1866, in lieu of the taxes on unmanufactured cotton, as provided in "An act, &c.," approved June 30, 1864, as amended by the act of March 3, 1865, there shall be paid by the producer, owner, or holder, upon all cotton produced within the United States, and upon which no tax has been levied, paid, or collected, a tax of 3 cents per pound, * * * and such tax shall be and remain a lien thereon, in the possession of any person whomsoever, from the time when this law takes effect, or such cotton is produced as aforesaid, until the same shall have been paid.

At the time of the passage of this last act the authority of the United States Government had been re-established over all the insurrectionary States, and said States had been divided into convenient collection districts, and assessors and collectors appointed to assess and collect all taxes which might accrue therein.

The act of March 2, 1867, provided that (section 1) on and after the 1st day of September, 1867, a tax of 2½ cents per pound only should be levied, collected, and paid on any cotton produced within the United States. And on the 3d of March, 1868, Congress passed an act providing "that all cotton grown in the United States after the year 1867 shall be exempt from internal tax."

According to the returns made to the Commissioner of Internal Revenue, there were collected on cotton the following amounts, to wit:

For the fiscal year ended June 30, 1863	\$351, 311 48
For the fiscal year ended June 30, 1864	1, 268, 412 56
For the fiscal year ended June 30, 1865	1, 772, 983 48
For the fiscal year ended June 30, 1866	18, 409, 654 90
For the fiscal year ended June 30, 1867	23, 769, 078 80
For the fiscal year ended June 30, 1868	22, 500, 947 77
Making a total sum of	<u>68, 072, 388 99</u>

The tax in all cases being imposed on the cotton, and required to be paid by the producer, owner, or holder, as the case might be, and being a lien on the cotton from the day of assessment until the same was paid, the collection of these taxes was often and largely made in States other than those in which the cotton was grown. Returns of collections from cotton were made from no less than twenty-six States, many of them States which produced no cotton, though the returns show that most of the tax was collected in the cotton-producing States.

The following is a list of the States in which taxes on cotton were collected, and the several amounts collected in each, to wit:

In Alabama	\$10,388,072 10	In Mississippi	\$8,742,995 93
In Arkansas	2,555,638 43	In Missouri	592,098 36
In California	430 04	In New Jersey	3,656 42
In Connecticut	193 64	In New York	867,942 68
In Florida	918,944 98	In North Carolina	1,959,704 87
In Georgia	11,897,094 98	In Ohio	447,127 12
In Illinois	379,144 42	In Pennsylvania	78,535 06
In Indiana	92,727 22	In Rhode Island	2,424 73
In Kansas	286 15	In South Carolina	4,172,420 16
In Kentucky	553,327 45	In Tennessee	7,873,460 71
In Louisiana	10,098,501 00	In Texas	5,502,401 24
In Maryland	51,349 52	In Utah	1,375 34
In Massachusetts	66,679 30	In Virginia	825,856 87

Of the twenty-six States enumerated above, and in which portions of the cotton-tax were collected, fifteen are not known as cotton-growing States, and none of the cotton on which taxes were collected was produced in those States, if we except, perhaps, two or three States, which, during the war, might have grown a very small quantity of an inferior article, as, for instance, the States of Illinois, Missouri, and Kentucky. The taxes collected in those States were on cotton which had been brought into the same from the insurrectionary States before any tax had been collected on it, and were assessed on the cotton in the hands of the owner, purchaser, or holder, according to the terms of the statute.

I have thus given a condensed statement with a view of showing the different enactments of law under which the cotton-tax was collected; the amounts collected for each fiscal year while the cotton-tax law was in force; the several States in which the tax was collected, and the total amount collected in each State, respectively, with the sum-total collected in all of said States. I have only to add further that in twenty States and Territories no returns were ever made to the Office of Internal Revenue of taxes collected on cotton. I have endeavored to show, also, that the power conferred on Congress by the Constitution to levy and collect taxes is not limited to particular and specified objects and sources, but, on the other hand, that it is general and unrestricted; and further, I have endeavored to show that at the time the cotton-tax was imposed the situation of the country and the wants of the Government were such as fully to warrant Congress in exercising the power conferred upon it to lay and collect taxes, duties, imposts, and excises to the utmost extent of the ability of the people to pay the same; and that the purposes for which these taxes were levied were national in their objects and character, were indeed the very purposes for which the people ordained and established the Constitution, as set forth in the preamble of that instrument.

Conceding that Congress has the power to lay and collect taxes, duties, imposts, and excises, the Constitution declares that they "shall be uniform throughout the United States," and it is alleged that the cotton-tax was levied and collected in violation of this rule of uniformity. The Constitution declares, section 9, clause 4, article 1, "that no capitation or other direct tax shall be laid unless in proportion to the census or enumeration hereinbefore directed to be taken." Direct taxes are well understood to be taxes on land and other real estate, and poll or capitation taxes on the persons of individuals.

By the act of August 5, 1861, a direct tax of twenty millions of dollars was annually laid upon the United States and Territories in proportion to the population of each, severally, as shown by the previous enumeration. In levying and collecting direct taxes, the Constitution itself has clearly defined the rule of uniformity. Each State shall pay according to, or in proportion to, its population, as previously ascertained by an

actual enumeration thereof. But no such rule of uniformity was contemplated by the Constitution with regard to indirect taxes, to imposts, and excise duties, and no such rule could be adopted, in the very nature of such taxes. Indirect taxes are taxes levied upon articles of consumption. The tax becomes a part of the cost of the article. It is paid by the consumer, and each person pays only so much as he consumes of the article.

What is the rule of uniformity in such cases? It cannot be that each State shall pay in proportion to its population. It cannot be construed to be such a rule as would limit Congress in its power to tax, so that only such objects would be legitimate sources of taxation as are common products of every State and Territory in the Union, and even then only in proportion to its population. Such a rule of uniformity, if adopted, would leave the National Government without the power of providing for its own expenditures. For, if applied to excise taxes levied upon the manufactures and products of the country, it might with equal propriety be claimed as the rule governing collections on imports; for imposts as well as excises are taxes upon articles of consumption, paid by the consumer, not according to any enumeration, nor paid according to the population of any or each State, but according to the quantity or amount of such article consumed by the people, by each person in his individual capacity.

What, then, is the rule of uniformity, according to which all imposts and excises are to be levied and collected throughout the United States? I reply that *it is the adoption of one rule or mode throughout the United States—a uniform rate in each and every State and Territory; so that whatever rate of tax is paid in one State or Territory, the same shall be paid in all; a uniform mode of assessing and collecting the tax, so that the burden of taxation shall fall equally upon the entire product of the country; and so that no undue advantages shall be given to the manufacturers or producers of one State over those of another State, or to the importers of foreign goods entering goods at ports of any particular State over the importers of any other State.*

Strictly in accordance with this rule of uniformity was the tax levied and collected on cotton. The rate of tax was the same for the same period on *all cotton grown* in the country, and a uniform mode of assessing and collecting the tax was observed. The tax was levied on the article—"on all cotton," and the tax was made a lien on the same in whosoever hands it might be found. If no tax had been assessed and collected before the cotton removed from the place where it was grown, then it was assessed and collected in whatever collection district or State it might be found. It is true that the rate of tax was several times changed, and so was the rate of tax on other articles and products changed from time to time as the exigencies of the Government demanded. At first, the rate of tax was one-half of one cent per pound; afterward, it was increased to two cents per pound, then to three cents per pound; then it was diminished to two and one-half cents per pound. But whatever the rate of the tax, the rule of uniformity was strictly preserved. At one and the same rate the tax was assessed and collected throughout the United States. Conforming to one rule or mode, the assessments and collections were everywhere made. Whenever practicable, the tax was collected in the State where the cotton was grown. But if the cotton was removed from the State where it was grown without the tax being collected thereon, then it was collected in the State to which it had been shipped; and whenever and wherever

the tax had been assessed, it became and remained a lien on the cotton until the same was paid.

One rule, and that strictly uniform, was thus observed throughout the United States in levying and collecting the cotton-tax, and the only rule of uniformity that the case admitted of. To deny the constitutional power of Congress to tax cotton grown in the country on account of a want of uniformity, because a portion of the States, or even a majority of them, produce no cotton, is to deny, not only the right of Congress to levy and collect a tax on cotton, but to tax any article produced by a State, whether an agricultural product or a manufacture, unless the same article is a common product of all the States and Territories; for the two cases are upon precisely the same reason. I will even go further, and assert that to require any other rule of uniformity than the rule I have shown was adopted in the collecting of the cotton-tax, viz, a uniformity in the rate of tax, and a uniformity in the mode of assessing and collecting the tax, would be to take from Congress the power of laying and collecting taxes on imports; for this is the only rule of uniformity which such taxes admit of throughout the United States. You cannot collect taxes on imports according to the rule of apportionment; and, fortunately, the Constitution requires such a rule only in case of direct taxes: "Representatives and direct taxes shall be apportioned among the several States which may be included within this Union according to their respective numbers." "No capitation or other *direct tax* shall be laid unless in proportion to the census or enumeration hereinbefore directed to be taken." But the Constitution declares that "all duties, imposts, and excises shall be uniform throughout the United States," without prescribing what the rule of uniformity shall be; and I think I have shown conclusively that Congress did observe a *rule of uniformity*, and the only one the case admitted of, in levying and collecting the cotton-tax. They made the rate of taxation the same, and the mode of assessing and collecting the tax the same in whatever State or Territory, and in every State or Territory, where cotton was produced, or to which it was removed; and in conformity with the same rule all imposts and excise taxes have been and are now being collected.

Again, it is alleged that the cotton-tax was unconstitutional, because it was a tax on articles exported from a State. Clause 5 of section 9, article 1 of the Constitution, declares that "No tax or duty shall be laid on articles exported from any State. No preference shall be given by any regulation of commerce or revenue to the ports of one State over those of another; nor shall vessels bound to or from one State be obliged to enter, clear, or pay duties in another."

In commenting upon this clause of the Constitution, Judge Story remarks that "the obvious object of its provisions is to prevent any possibility of applying the power to lay taxes, or regulate commerce, injuriously to the interests of any one State so as to favor or aid another. If Congress were allowed to lay a duty on exports from any one State, it might unreasonably injure, or even destroy, the staple productions or common articles of that State. The inequality of such a tax would be extreme."

Congress has not power to lay a duty on exports from any State. The reason why no such power was permitted to Congress is well stated in the quotation above, and no one, I presume, would claim for Congress any such right, or undertake a defense of Congress should it attempt to exercise such a right.

The cotton-tax was not levied as a tax on an article of exportation, or because it was exported, but as a product of the country largely

consumed by the country ; an article which entered directly into fabrics manufactured more or less in every State in the Union, and constituting a material portion of the clothing and household furnishing of every family and individual in the country. It was levied and collected, as I have before shown, at a time when the perpetuity of the Government and the future well-being of its nearly forty millions of people were trembling in the balance. It was imposed as a war measure, or a war tax—a tax levied on cotton “held or owned by any person or persons, corporations, or associations of persons,” on or after the 1st day of October, 1862. It was an internal-revenue or excise tax. The act under which the tax was imposed is entitled “An act to provide internal revenue to support the Government and to pay the interest on the public debt.” It was passed by Congress in pursuance of the authority and power granted by the Constitution of the United States “to lay and collect taxes, duties, imposts, and excises,” and not in the exercise of a power denied to Congress. Had Congress imposed a tax on cotton or any other agricultural product, on lumber or iron, or gold or silver, or manufactured articles, when exported from a State, and *because* they were exported, making the fact of such exportation the reason for such tax and the grounds for assessing and collecting it, such a tax would have been clearly in violation of the Constitution. It would have been an exercise of a power denied to Congress. But such was not the case with the tax levied on cotton. The question of exportation nowhere entered into the account. No liability was incurred on any cotton which was or might have been exported which would not have accrued equally on the same had it been retained in the State where it was produced. The tax was on all cotton which had been produced, and was in the possession of any person or persons, except such as might be in the hands of a manufacturer of cotton fabrics on the 1st day of October, 1861, and on all cotton thereafter produced until the repeal of the tax. The same laws that imposed a tax on cotton imposed like taxes on all the leading industries of the country, and for the same purpose : with no invidious distinction or desire to cripple the industry of a State by imposing a tax on one of its chief staples, not by the imposition of a tax on “exports,” but by the imposition of an excise tax on an article of universal use or consumption, and in such a manner that the payment of the tax, like all indirect taxes, should fall upon the consumer, and of which every person paid only so much as he consumed of the article.

I have thus endeavored to show that the arguments advanced in favor of refunding the cotton-tax, so far as they are founded on any alleged violation of the Constitution, and of those clauses of the Constitution which require that all taxes, duties, imposts, and excises shall be uniform throughout the United States, and that no tax or duty shall be laid on articles exported from a State, are specious and superficial, and are neither warranted by the letter nor spirit of that instrument, by the laws of Congress which imposed the tax, by the circumstances under which the tax was imposed, nor by the manner prescribed for assessing and collecting the tax ; but, on the contrary, the Constitution confers on Congress power to levy taxes, duties, imposts, and excises to any extent deemed necessary to pay the public debt and to provide for the common defense and welfare of the United States ; that the cotton-tax was levied in pursuance of the power granted by the Constitution, was levied according to a strict rule of uniformity, and was an internal-revenue tax, and not a tax “on articles exported from any State.”

Having thus disposed of the constitutional question involved in this

case, I now propose to examine the second reason urged for the refunding of the cotton-tax, viz, that "the tax was unequal and oppressive in its operation ;" and,

1. This alleged inequality is based on the assumption that the tax fell entirely upon the producers of the cotton.

But this assumption is in direct opposition to the whole theory of indirect taxes, and in palpable opposition to the facts in this particular case. Indirect taxes—and such are all taxes imposed and collected on goods, wares, merchandise, and articles imported from foreign countries, and all excise taxes imposed and collected upon the manufactures and products of a country—when paid by the importer, manufacturer, or producer, are added to the original cost of the article by the importer, or added by the manufacturer or producer to the cost of production, and is one of the items which go to make up the price or value of the article. The tax enhances the price or value of the article. The consumer is required and is obliged to pay so much more in consequence of the impost or excise tax.

Indirect taxes are paid by the consumers of the articles taxed, and each person pays so much, and only so much, of any given tax of this kind as he consumes of the articles taxed. This is the theory of all indirect taxation, and the facts in the case correspond with the theory. Every one at all conversant with the facts in this case knows, that immediately upon the imposition of internal-revenue taxes by the act of July, 1862, there was an advance in the prices of all articles, goods, wares, and merchandise upon which a tax was levied, and there was a constant appreciation of prices corresponding with the increase in the rates and amount of tax imposed from time to time, and these advanced prices were kept up until the taxes were removed. Under the tariff laws, passed at the same time, prices of all imported goods advanced equally with the advanced prices of domestic goods. Who paid the tax of 20 cents per pound on tea? The tax of 10 cents per pound on coffee? The taxes on silks, broadcloths, wines, liquors, &c., of 40, 50, 60, or 100 per cent. *ad valorem*? Not the importers of these articles, but the consumers. And who paid the tax of 3, 5, or 6 per cent. *ad valorem* on all agricultural implements, if not the farmers of the country who purchased and used such implements? Who paid the taxes on all cloths, and knitted, woven, or felted fabrics? On boots, shoes, and clothing of all descriptions? On mineral coal; on salt, fruits, fish, vegetables, &c.? The people paid these taxes, and with a cheerfulness and an alacrity truly surprising. And the people would regard any man as insane who should seriously deny that they had paid any portion of these taxes, and claim that it was only the importers, the manufacturers, and the producers that had been paying the Government taxes for the last ten years. True, the Government looks to the importer, the manufacturer, and the producer primarily to pay such taxes, which they in turn charge over to and collect from the purchaser or the consumer. To have collected from the consumers of tea and coffee the duties levied on those articles by the act of August 5, 1861, and subsequent acts, would have been attended with as many difficulties, and been as equally impracticable and impossible, as it would now be to refund to the consumers of tea and coffee all the taxes they have paid on those articles since the above date. But because of this inherent impossibility of collecting these taxes otherwise than is done by and through the importers, manufacturers, and producers, we are not, on that account, any the less to regard them as taxes paid by the consumers.

During the entire period the law taxing cotton was in force the de-

mand for cotton exceeded the supply. After April, 1861, additional supplies of cotton from the States in insurrection were almost entirely cut off. The stock on hand at the time of the passage of the first internal-revenue law had been so nearly consumed that almost any price could be obtained for it by those who had cotton to sell. The tax of one-half a cent a pound was a matter of no moment, and was cheerfully paid by the purchaser. The old stock in time became entirely exhausted. Cotton fabrics brought fabulous prices, and were entirely insufficient to meet the demand. Substitutes for cotton had to be sought, and even cotton rags were picked up by machinery, and an article of cotton shoddy, unknown to trade before, was made to help supply the demand for cotton. Not only was there no cotton to keep the mills in this country in operation, but the supply for foreign countries was also short. Cotton everywhere advanced in price, and those prices have never receded to their normal condition before the war. To-day cotton is quoted at 20, 21, and 22 cents per pound in the markets of the country, whereas before the war 10 cents per pound was a remunerative price. During all the period of the cotton tax high prices prevailed. The demand exceeded the supply, so that there was no obstacle in the way which prevented the producers adding the tax to the cost of production, and compelling the purchaser to pay the same. That they did so there can be no doubt. Any other supposition would argue that the cotton-producers are less awake to their own interests, and less shrewd in protecting them, than other classes of tax-payers—propositions not to be entertained.

These facts, which are incontrovertible, go to show conclusively that the consumers of cotton fabrics in this country paid their full share of the cotton-tax; and the short supply and high prices ranging in foreign markets amply protected the cotton growers and shippers, and enabled them, notwithstanding the tax, to realize prices unusually remunerative on all cotton exported from the country.

2. The second reason urged why this cotton-tax was unequal and oppressive, is, that it was imposed without the consent of the southern people, and when they were wholly unrepresented.

To this I reply that neither the assent nor the consent of the people is required to be had before Congress can levy any tax within its legitimate power, and which, in its judgment, is required to enable it to discharge the duties and meet the obligations of the National Government. Congress did not ask consent of the manufacturers or the miners, of the fishermen or the mill-men, of the country, to levy and collect taxes on their several industries; and why should it any more have gained the consent of the cotton-growers before taxing that article? By the people of the whole country, the South no less than the North and the West, the power of imposing taxes, and the right of judging as to the time of levying them, the extent to which they shall be levied, and the articles and sources upon which they shall be levied and collected, are conferred upon Congress. The people may make known their wishes through their petitions, they may utter their objections through remonstrances; but neither petitions nor remonstrances can take from Congress the power or the right to pass such revenue laws as it shall deem expedient. The people having once delegated that right and power to Congress, they must now abide by the decisions which Congress shall make.

That the southern people were wholly unrepresented in Congress when the internal-tax bill, which imposed a tax on cotton, was passed, is only too true. But whose fault was it that they were unrepresented?

It was not the fault of the States that *were* represented, nor of the *people* of those States. It was not the fault of *Congress*, nor of the *judicial* or *executive* branches of the Government. It was not the fault of any one or all of these. It was the fault of the cotton States and the people of the cotton States. It was the fault of their own Senators and Representatives. These, one after another, under instructions from those whom they represented, or self-impelled, resigned their seats in Congress and returned to their constituents to make war upon the United States, to disrupt the Federal Union, and to establish a southern confederacy out of the broken fragments. These were voluntary acts on the part of the Southern States and their representatives. Gladly would I draw the veil of oblivion over this painful record; but where such a reason as this is put forth for the refunding of a tax made necessary by the very circumstances on which the claim for refunding is based, the truth must be told. Had the representatives of the South remained in allegiance to the National Government, had they retained their seats in Congress and used the same amount of influence and persuasion to dissuade their people from entering into insurrection and rebellion as they did exert to push them into it, there would have been no rebellion, no war, no cotton-tax, no internal-revenue tax of any kind. Having chosen their own course and taken it voluntarily, having committed the great wrong of resigning their seats in Congress, inaugurating war, and prosecuting it until hope was extinguished and all further efforts became vain and futile, we say, and we have a right to say, "Gentlemen, you cannot now take advantage of your own errors, wrongs, and mistakes."

In the late war between France and Germany, after most of the territory of France had been overrun by the German armies, and the city of Paris had capitulated, Germany demanded, as a condition of peace, that France should pay her war expenses; and no less a sum than five thousand millions of francs, or nearly one thousand millions of dollars in gold and silver, were required to be paid as indemnity by the conquered nation, in addition to the cession of two entire provinces of France to Germany, Alsace and Lorraine, and German garrisons were left in France, and a portion of them are still there, to enforce the payment of this money. Contrast this with the conduct of our own Government toward the rebellious States of the South. I will not undertake to draw the contrast; it is too apparent to need drawing. And yet these States now come forward and ask Congress to provide for refunding (to whom?) the tax, amounting to some sixty-eight millions of dollars, levied and collected on cotton during the four years she was waging an unsuccessful war against the national Government; a tax, too, not paid by the cotton States exclusively or mainly, but paid, as I have shown, by the people of the country who were consumers of cotton fabrics, or by foreign consumers, who purchased the cotton at enhanced prices on account of tax. And one of the reasons for this demand now made upon the Government is that the South was wholly unrepresented in Congress at the time the cotton-tax was levied. What greater proof could be given of the kindness and leniency of the General Government than the fact that within six years from the close of the rebellion, and even before time had been given for a complete restoration of all the seceding States to their former relations, such a proposition could not merely be entertained by any considerable number of persons, but confidently and persistently urged upon Congress for its favorable action.

I now come to examine the third and last reason I have seen offered why this cotton-tax should be refunded—on the ground that it was unequal and oppressive in its operation, to wit:

3. "Because the producers of cotton paid the same taxes that all other citizens paid, and the extra tax on cotton besides."

If what I have aimed to establish, and what I think I have established beyond the possibility of successful contradiction, be true, viz, that all indirect taxes are paid alternately by the consumers, and that the tax levied and collected on this cotton was paid equally by the consumers as other taxes of an indirect character, as taxes on coals, oils, salt, tobacco, distilled spirits, &c., then this reason urged for a refund of the cotton-tax entirely fails. And I have no hesitation in declaring it as my settled conviction that the same and equally good reasons exist to-day why Congress should provide by law for refunding all taxes collected on mineral coals, pig-iron, on petroleum, and other crude oils, on salt, manufactured tobacco, distilled spirits, and numerous other articles that I could name, as that the taxes collected on cotton should be refunded.

That the so-called cotton States have not paid more than their proportionate share of the internal-revenue taxes which have been collected since September 1, 1862, till the present time, facts and figures, which are matters of record in the Office of Internal Revenue, will fully attest. During the continuance of the rebellion, and until after its close and the establishment of collection-districts over the south, which covered the entire fiscal years of 1863, 1864, and 1865, no taxes were collected in said States, save and excepting small collections on the articles of cotton and turpentine, collected by Treasury agents within the lines of the Union armies. And after the establishment of collection-districts, instructions were issued by the Secretary of the Treasury and the Commissioner of Internal Revenue to the revenue-officers of the South, not to enforce the collection of taxes on any manufactured articles, or distilled spirits, on manufactured tobacco found in the hands of a purchaser, where satisfactory evidence was furnished that such articles, &c., had been actually sold, and had passed out of the hands of the manufacturer before the establishment of collection-districts and the appointment and qualification of assessors and collectors. The only exception made to this rule was in the case where goods, made subject to tax by any internal-revenue law, were shipped beyond the limits of the States which had been in insurrection, and were put upon the market to compete with like goods on which a tax had been paid. Complete exemption was given to all goods manufactured and sold in the insurrectionary States during the continuance of the rebellion, and no attempt was ever made to hold the manufacturers of the South liable for any taxes on articles made and consumed during the continuance of the war or afterward, if consumed within the limits of the States which had been in insurrection.

Up to June 30, 1872, according to the last annual report of the Commissioner of Internal Revenue, the aggregate amount of taxes collected from all sources under the several internal-revenue laws since September 1, 1862, is a little over seventeen hundred and fifty-eight millions of dollars, and I find, upon examination, that of every one thousand dollars of this sum, the article of cotton paid thirty-eight dollars, while tobacco and distilled spirits paid one hundred and thirteen, and one hundred and ninety-one dollars, respectively, on each one thousand. I presume the cotton States actually consumed their full share of the tobacco and distilled spirits consumed in the country, and therefore did, as consumers, pay their proportion of these taxes during the period since they have commenced to use tax-paid tobacco and distilled spirits on which taxes have been collected. But what I mean to say is, that where cotton has paid one dollar tax, tobacco has paid three, and distilled spirits five

dollars, and that these taxes were collected mainly in States other than cotton-producing States. But I have another comparison to make, which, I think, demonstrates mathematically that the allegation that the producers of cotton paid the same taxes that all other citizens paid, and the cotton-tax which others did not pay, is without foundation in fact.

According to the census of 1870 the State of Rhode Island, which produces no cotton, has about 30,000 more of population than the State of Florida, which is a cotton-producing State. By an examination of the returns made of collections from these two States I find that, while the collections from other sources than cotton made in Rhode Island amount to the round sum of \$25,024,953, the collections from sources other than cotton, in Florida, show only the inconsiderable sum of \$538,508. Comparing the State of Alabama, with a population of 996,992 persons, with the State of New Jersey, having a population of 906,096, or 90,000 less, the former being a cotton-growing State, while the latter produces no cotton, I find that the collections made in the former, from sources other than cotton, was \$3,812,910; while the collections from the latter were \$48,524,642. In Georgia, containing a population of 1,184,109 persons, there were collected, from other sources than cotton, \$6,520,515; while in Michigan, with a population of 1,184,059 persons, there were collected \$24,099,806. I could continue these comparisons between the cotton-producing States and States which produce no cotton, showing the same relative differences in the amount of taxes collected from other sources than cotton. And even including cotton, it will be found that the sum total of all collections are largely in excess in the non-producing cotton States. Thus:

Florida shows a total tax of	\$1, 457, 453
Rhode Island a total tax of	25, 027, 378
Alabama a total tax of	14, 200, 982
New Jersey a total tax of	48, 528, 298
Georgia a total tax of	18, 417, 610
Michigan a total tax of	24, 099, 806

As stated in the early part of this argument, Congress, in the exercise of its constitutional power, and to meet the exigencies in which the rebellion had placed the national Government, resorted to a system of taxation so broad and comprehensive in its objects and scope as to bring the entire products of the country within its range. The cotton and tobacco of the South were taxed equally with the coal, the oils, and iron of the Middle States; the agricultural products of the West, the gold and silver and fisheries of the Pacific States; and the lumber, stone quarries, and manufactures of the Northern and Eastern States. These taxes were assessed and collected with no invidious distinctions. They have been paid by the people; and if any portion of them is to be paid back, whether it be that portion collected on cotton or from any other source, the people have got to provide the means of making such payment by taxes collected from themselves in some other way. Who will say that Congress shall continue to collect taxes on manufactured tobacco, distilled spirits, and fermented liquors, for the purpose of paying back those which have been paid on cotton? And if the cotton-tax is to be paid back, why not pay back taxes collected on petroleum, pig-iron, and anthracite and other coals, paid principally in Pennsylvania? The tax on gold and silver collected in California? The fish of Oregon? The oysters of Maryland? The lumber of Maine and Michigan? The salt of New York and West Virginia? And so on through the whole

range of articles and products on which taxes have been levied and collected; and if paid back, they never can be paid to the persons entitled to them, as I think I have most conclusively shown, viz, to the *consumers* of the country.

In view of the considerations and the facts I have thus presented, I am forced to the conclusion that there are no obligations resting upon the Government of the United States to refund the cotton-tax, either based on those clauses of the Constitution that require that all taxes, duties, and imposts, shall be uniform throughout the United States, and that no duties shall be levied on any articles exported from a State, or based on any principles of justice and equity which have been violated in levying and collecting the cotton-tax; nor on account of any disproportion in the amounts of internal taxes paid by the cotton States. But, on the contrary, that it would be grossly unjust to require *the people* of this country, after having *once paid* this tax, to be taxed again to pay it *a second time*; not to the Government; not to the consumers of the country, which is impossible, but to middle-men; to men who paid no more than their proportionate share of the tax originally, and who have no just claims upon the Government for this money. For the official records of the Government show that the tax on a large proportion of the cotton was assessed and collected from these middle-men or factors, and if it is to be paid back to them, they will receive it from the Government, not as the payment of a debt, but rather as a gift.

ISRAEL KIMBALL,

*Head of Division in Charge of Manufactures,
Products, &c., and Taxes on Sales.*

INTERNAL-REVENUE OFFICE, *January 28, 1873.*

○

EXPENDITURES FROM CONTINGENT FUND — TREASURY
DEPARTMENT.

L E T T E R

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

A detailed statement of the expenditures from the contingent, fuel and lights, and furniture and carpet funds of his Department for the fiscal year ended June 30, 1872.

FEBRUARY 8, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
Washington, D. C., February 3, 1873.

SIR: I have the honor herewith to inclose a detailed statement of the expenditures from the contingent, fuel and lights, and furniture and carpet funds of this Department for the fiscal year ended June 30, 1872, as required by the first section of the act of March 3, 1869.

I have the honor to be, very respectfully, your obedient servant,
GEO. S. BOUTWELL,
Secretary.

HON. JAMES G. BLAINE,
Speaker of the House of Representatives.

TREASURY DEPARTMENT,
Washington, D. C., February 3, 1873.

SIR: I have the honor herewith to inclose a detailed statement of the expenditures from the contingent, fuel and lights, and furniture and carpet funds of this Department for the fiscal year ended June 30, 1872, as required by the first section of the act of March 3, 1869.

I have the honor to be, very respectfully, your obedient servant,
J. H. SAVILLE,
Chief Clerk.

HON. GEORGE S. BOUTWELL,
Secretary of the Treasury.

2 CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT.

Expenses of the Treasury Department for the fiscal year ended June 30, 1872.

Date.	Name.	Article.	Amount.
CONTINGENT.			
1871.			
July 1	E. C. Bartlett	Mileage	\$40 00
12	H. Baumgarten	Hand-stamps, &c.	17 50
27	S. D. Castleman	2 barrels of lime	2 20
28	A. V. S. Smith	Copper wire cord	11 00
28	T. Mach	1,665 pounds of hay	29 97
28	Walker White	Night-work	1 00
28	Joseph Witherall	2,235 pounds of hay	37 99
28	A. Bean	2,615 pounds of straw	26 15
28	J. F. Doran	Shoeing horses	17 00
31	Richard Hill	Care of horse	25 00
31	B. F. French	Books	32 65
31	Beall & Shoemaker	Oats, &c.	106 75
31	J. McDermott & Brothers	Repairs of wagons	91 00
31	H. Baumgarten	Stencil-plates, &c.	15 50
31	Mrs. A. Johnston	Making table-covers	5 00
31	Washington and Georgetown Railroad Company.	1,000 tickets	50 00
31	Harriet McKean	Rent of building	100 00
31	John H. Clark	do	100 00
31	Franklin Telegraph Company	Telegrams	45 00
31	Western Union Telegraph Company	do	151 48
31	P. Sullivan	Care of horses and wagons	135 00
31	Independent Ice Company	104,895 pounds of ice	374 62
31	do	Ice furnished to Bureau of Engraving and Printing.	92 41
31	Employés of bindery	Pay-roll	650 41
31	Employés of laundry	do	322 96
Aug. 5	N. C. Draper & Co	Sawdust, 13 barrels	2 60
29	Baltimore and Ohio Railroad Company	Freight	3 81
29	do	do	2 03
29	J. F. Doran	Horseshoeing	24 25
30	H. Senker	Ice-pitcher	18 00
31	H. Blau	Laying carpets	124 11
31	do	Chair cushions	39 00
31	Washington Gazette	Advertising	13 00
31	Washington Chronicle	do	42 00
31	Samuel Lloyd	Watering street, July and August	200 00
31	J. F. Doran	Horseshoeing	4 00
31	Beall & Shoemaker	Feed	116 23
31	Washington Republican	Advertising	48 00
31	Washington and Georgetown Railroad Company.	Tickets	50 00
31	New York Daily Bulletin	Subscription	4 50
31	Franklin Telegraph Company		1 45
31	Columbia Railroad Company	Tickets	50 00
31	Washington and Georgetown Railroad Company.	do	50 00
31	Metropolitan Railroad Company	do	50 00
31	William Simpson	1,540 pounds of hay	21 56
31	J. Wells	2,050 pounds of hay	30 75
31	Washington Star	Advertising	26 00
31	New York Tribune	Subscription	3 87
31	J. McDermott & Brothers	Repairs of wagons	19 50
31	J. H. Saville	Traveling expenses	23 00
31	Harriet McKean	Rent	100 00
31	John H. Clark	do	100 00
31	Independent Ice Company	120,005 pounds of ice	428 59
31	P. Sullivan	Care of horses	135 00
31	Employés of bindery	Pay-roll	580 41
31	Employés of laundry	do	355 16
Sept. 3	Adams Express Company	Freight	48 50
3	do	do	37 20
3	S. M. B. Servoss	Mileage	8 00
4	L. Murphy	Repairs of harness	20 75
4	Charles Keene	3,540 pounds of hay	60 26
5	B. W. Reed & Son	Soap, &c.	5 30
7	John Semmes	1,460 pounds of straw	10 22
8	W. W. Hayne	Plans of Hotel de Ville	12 00
9	Richard Hill	Care of horse	25 00
9	Washington and Georgetown Railroad Company.	Tickets	50 00
10	Washington and Georgetown Railroad Company.	do	50 00
14	S. M. B. Servoss	Mileage	24 00
18	John J. Tower	Revolvers, &c.	150 25
18	Henry Kimmel	Repairing ice-pitcher	1 65
20	Yates & Wiswall	Crash, &c.	109 91
20	Franklin Telegraph Company		38 08
20	H. S. Vanderbilt	Mileage	27 60

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
CONTINGENT—Continued.			
1871.			
Sept. 23	John Whittaker	2,140 pounds of hay	\$37 45
26	Z. D. Gilman	Brushes	2 50
26	Washington and Georgetown Railroad Company.	Tickets	50 00
28	Metropolitan Railroad Company	do	50 00
30	Walker White	Night-work	1 50
30	John Chubb	1,400 pounds of straw	12 60
30	John Bell	Sealing ship's registers	25 00
30	P. Sullivan	Care of horses	106 99
30	Employés of bindery	Pay-roll	522 41
30	Employés of laundry	do	325 47
Oct. 1	American Sanitary Association	1 barrel carbolic powder	26 18
1	Harriet McKean	Rent of building	100 00
1	John H. Clark	do	100 00
1	Henry Kimmell	Repairing ice-pitcher	1 25
2	J. Gant, 2d	Hauling	65 00
2	J. McDermott & Brothers	Repairing wagons	87 75
4	Beall & Shoemaker	Oats, &c.	123 60
7	W. Corcoran	Putting in coal	69 30
10	Western Union Telegraph Company	Telegrams	224 21
10	Independent Ice Company	Ice	331 39
10	J. F. Doran	Horseshoeing	20 25
10	T. H. S. Boyd	Railroad directories	15 00
10	P. Sullivan	Care of horses	30 00
10	R. Hill	Care of horse	25 00
10	M. Wiley	Hay	52 50
10	Adams Express Company .....	.....	72 55
10	do .....	.....	89 65
10	Franklin Telegraph Company .....	.....	1 28
10	do .....	.....	20 12
10	Baltimore and Ohio Railroad Company	Freight	1 10
10	Washington and Georgetown Railroad Company.	Tickets	50 00
13	Charles Anjier	1 pair of horses	600 00
13	L. B. Pratt	Hemming towels	26 75
14	Allan Rutherford	Mileage	92 40
14	M. G. Brown	Hay	48 97
14	J. F. W. Dolan	do	49 00
14	W. Corcoran	Putting in coal	63 26
15	R. M. Jones	Mileage	8 00
16	Lorenzo Rice	Cleaning carpet	174 85
16	Franco-American	Subscription	5 00
16	Daniel Smith	Sawdust	2 00
16	H. Baumgarten	Stamp	60 00
18	L. H. Schneider	Hardware	9 64
18	Franklin Telegraph Company .....	.....	23 00
18	W. Ramsey	Care of horses	25 00
18	Scientific American	Subscription	75
18	Baltimore and Ohio Railroad Company	Freight	126 70
20	Charles Vosburg	Care of horses	25 00
20	W. T. Bell	Straw	12 82
20	L. Gardner	Making bags	93 75
23	Washington and Georgetown Railroad Company.	Tickets	50 00
30	Washington and Georgetown Railroad Company.	do	50 00
30	Baltimore and Ohio Railroad Company	Freight	1 35
30	John Willis	Straw	26 46
31	P. Sullivan	Care of horses	138 15
31	Employés of bindery	Pay-roll	552 41
31	Employés of laundry	do	324 97
31	Steamer E. C. Knight	Freight	51 71
Nov. 1	Samuel Lloyd	Watering street :	100 00
1	Beall & Shoemaker	Feed	151 20
2	Independent Ice Company	Ice	261 87
4	T. H. S. Boyd	Directories	15 00
4	Yates & Wiswall	Crash	48 94
4	H. Blau	Draping building	15 64
4	Western Union Telegraph Company .....	.....	171 14
4	John H. Clark	Rent of building	100 00
4	J. McDermott & Brothers	Repairing wagons	94 00
4	J. Gant	Hauling	62 50
4	L. H. Schneider	Hardware	4 75
4	W. D. Wyvill	do	5 00
6	J. F. Doran	Horseshoeing	25 00
6	S. M. B. Servoss	Mileage	8 00
6	L. B. Pratt	Hemming towels	20 00
8	Washington and Georgetown Railroad Company.	Tickets	50 00

4 CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT.

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
CONTINGENT—Continued.			
1871.			
Nov. 9	Metropolitan Railroad Company	Tickets	\$50 00
9	Harriet McKean	Rent of building	100 00
9	Martin, Patten & Magruder	Mileage	216 00
10	Franklin Telegraph Company		46 08
10	do		1 50
10	Benjamin Durfee	Mileage	80 75
10	Columbia Railroad Company	Tickets	50 00
10	H. Baumgarten	Repairing stamps	3 00
15	Richard Hill	Care of horse	25 00
15	William Conrad	Mileage	36 05
15	Yates & Wiswall	Linen	92 72
17	Rives & Bailey	Subscription to Congressional Globe	310 00
17	Western Union Telegraph Company		224 15
17	Baltimore and Ohio Railroad Company	Freight	2 42
17	Commercial List	Subscription	66
18	Franklin Telegraph Company		19 58
18	Internal Revenue Record	Subscription	10 00
18	New York Commercial and Financial Chronicle.	do	3 00
18	New York Shipping List	do	2 75
18	New York Tribune	do	11 31
20	Adams Express Company	Freight	144 75
20	do	do	97 45
20	L. Murphy	Repairing carriage	8 00
20	A. J. Joyce & Company	do	75 75
20	W. H. & O. H. Morrison	Books	137 05
24	Washington and Georgetown Railroad Company.	Tickets	50 00
25	New York Commercial Advertiser	Subscription	10 75
25	Washington Republican	do	9 00
29	J. McDermott & Brothers	Repairing wagon	173 25
30	P. Sullivan	Care of horse	255 00
30	Employés of bindery	Pay-roll	596 41
30	Employés of laundry	do	321 68
Dec. 1	Richard Hill	Care of horse	25 00
1	A. J. Joyce & Company	Repairing carriages	36 00
1	Harriet McKean	Rent of building	100 00
1	W. F. Clark	Mileage	32 00
1	H. Baumgarten	Stamp	18 50
1	J. Gant	Hauling	58 13
1	L. B. Pratt	Hemming towels	25 75
2	Baltimore and Ohio Railroad Company	Freight	5 32
2	J. F. Young	Hay	63 72
2	Beall & Shoemaker	Feed	957 00
2	J. F. Doran	Horseshoeing	28 00
2	Independent Ice Company	Ice	242 44
4	John H. Clark	Rent of building	100 00
7	Washington and Georgetown Railroad Company.	Tickets	50 00
7	Metropolitan Railroad Company	do	50 00
7	T. H. S. Boyd	Directories	15 00
7	W. H. & O. H. Morrison	Books	173 25
11	Franklin Telegraph Company		50 33
14	F. G. Boyer	Hay	52 40
14	Adams Express Company	Freight	55 50
14	John Saul	Hyacinths	36 00
16	Allan Rutherford	Mileage	74 60
16	J. McDermott & Brother	Repairing wagons	52 75
16	Washington and Georgetown Railroad Company.	Tickets	50 00
16	L. A. Lodge	Hay	58 95
18	Boston Post	Subscription	20 50
18	John A. Gray	Meals to clerks on extra duty	180 00
18	John Saul	Plants	13 40
18	J. F. Young	Hay	72 45
20	do	do	65 79
20	H. Baumgarten	Repairing stamps	18 00
20	Washington Chronicle	Subscription	2 65
22	P. Sullivan	Care of horses	65 40
27	Washington Chronicle	Subscription	54 35
28	B. F. French	Books	24 10
29	John Bell	Sealing registers	25 00
29	W. H. Whitney	Mileage	235 70
29	Harriet McKean	Rent of building	100 00
29	Employés of bindery	Pay-roll	596 41
29	Employés of laundry	do	240 03
1872.			
Jan. 2	L. B. Pratt	Hemming towels	25 00
2	Richard Hill	Care of horse	25 00

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
CONTINGENT—Continued.			
1872.			
Jan. 2	J. F. Doran.....	Horseshoeing.....	\$21 75
2	John H. Clark.....	Rent of building.....	100 00
2	William Ballentyne.....	Amberg B. file.....	2 30
2	New York Tribune.....	Subscription.....	6 45
2	Army and Navy Journal.....	do.....	5 82
2	William Scholler.....	Cleaning snow.....	60 00
2	P. Sullivan.....	Care of horse.....	115 00
2	Kneessi & Norfleet.....	Repairing harness.....	160 75
2	do.....	do.....	251 70
4	Beall & Shoemaker.....	Feed.....	99 00
4	Andrew Gibney.....	Mileage.....	46 40
4	Independent Ice Company.....	Ice.....	225 43
4	Engraving and Printing Bureau.....	Repairing seal.....	7 00
5	Washington and Georgetown Railroad Company.....	Tickets.....	50 00
7	Western Union Telegraph Company.....		167 28
7	A. C. Adamson.....	Mileage.....	46 00
7	Samuel Godfrey.....	Corn.....	26 00
8	J. R. Trimbley.....	Frames.....	5 65
9	Metropolitan Railroad Company.....	Tickets.....	50 00
9	Washington Republican.....	Subscription.....	164 10
9	Boston Commercial Bulletin.....	do.....	4 00
9	Eclectic Magazine.....	do.....	5 00
9	New York Evening Post.....	do.....	12 00
9	Mining Journal.....	do.....	2 75
9	Journal of Science.....	do.....	6 00
9	Public Record.....	do.....	4 00
9	Scientific American.....	do.....	3 00
9	Commercial and Financial Chronicle.....	do.....	10 00
9	New York Price Current.....	do.....	9 00
9	Industrial Publishing Company.....	do.....	1 50
9	Commercial and Financial Chronicle.....	do.....	10 00
9	New York Times.....	do.....	12 00
9	Baltimore American.....	do.....	9 00
9	United States Railroad Mining Register.....	do.....	3 00
9	New York Bulletin.....	do.....	10 00
9	New York Commercial List.....	do.....	4 00
9	New York Tribune.....	do.....	10 00
9	Tobacco Leaf Publishing Company.....	do.....	4 00
9	Franklin Telegraph Company.....		42 28
9	Daniel Smith.....	Saw-dust.....	5 60
11	Carl Keefe.....	Straw.....	22 35
13	Allan Rutherford.....	Mileage.....	45 80
15	New York Mercantile Journal.....	Subscription.....	9 50
16	Railroad Gazette.....	do.....	4 00
16	Druggists' Circular.....	do.....	1 50
16	Washington Republican.....	do.....	32 00
17	J. McDermott & Brothers.....	Carriages.....	700 00
18	Washington and Georgetown Railroad Company.....	Tickets.....	50 00
19	J. R. Maceron.....	Laborer in bindery.....	7 50
20	H. Baumgarten.....	Repairing stamp.....	2 00
20	C. Biddle.....	Taking testimony.....	120 00
20	John T. Murray.....	Summoning witness.....	18 00
20	Samuel Houston.....	Mileage.....	93 60
22	R. W. Taylor.....	do.....	65 05
23	Adams Express Company.....	Freight.....	89 90
23	do.....	do.....	19 65
24	A. Carr.....	Straw.....	17 13
24	R. B. Mohun & Co.....	Books.....	36 75
24	Western Union Telegraph Company.....		151 62
25	Willis Young.....	Moving Second Auditor's files and furniture.....	142 00
25	National Bank Note Reporter.....	Subscription.....	3 00
25	Commercial and Financial Chronicle.....	do.....	10 00
25	Saint Louis Journal of Commerce.....	do.....	4 00
25	Bankers' Magazine.....	do.....	5 00
25	Philadelphia Press.....	do.....	8 00
25	Chicago Tribune.....	do.....	14 50
25	San Francisco Herald.....	do.....	9 00
25	Boston Advertiser.....	do.....	12 00
25	New York Times.....	do.....	12 00
25	New York Evening Post.....	do.....	13 00
25	New York Times.....	do.....	12 00
25	New York National Gazette.....	do.....	7 50
25	Chicago Tribune.....	do.....	11 50
25	Pittsburgh Business Printing Co.....	do.....	4 00
25	New York Gold Exchange.....	do.....	2 00
25	Commercial and Financial Chronicle.....	do.....	10 00

6 CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT.

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
CONTINGENT—Continued.			
1872.			
Jan. 25	P. Thyson.....	Cane.....	\$7 30
26	H. Ansley.....	Repairing clocks.....	2 50
27	James Ridgway.....	Corn.....	24 70
27	B. F. French.....	Books.....	59 70
30	J. McDermott & Brothers.....	Repairing carriage.....	4 50
31	John H. Clark.....	Rent of building.....	100 00
31	Employés of bindery.....	Pay-roll.....	651 66
31	Employés of laundry.....	do.....	379 06
Feb. 1	P. Sullivan.....	Care of horses.....	115 00
1	L. B. Pratt.....	Hemming towels.....	21 50
1	J. McDermott & Bro.....	Repairing wagons.....	76 00
1	J. B. McKay.....	Medical care for horses.....	10 00
2	W. Schooler.....	Removing snow.....	38 50
2	A. J. Joyce & Co.....	Repairing carriages.....	28 00
2	Harriet McKean.....	Rent of building.....	100 00
2	J. F. Doran.....	Horseshoeing.....	33 25
2	Beall & Shoemaker.....	Feed.....	78 45
2	Chronicle Publishing Company.....	Subscriptions.....	119 48
5	Richard Hill.....	Care of horse.....	25 00
6	William Schooler.....	Removing snow.....	51 25
6	Independent Ice Company.....	Ice.....	234 28
8	J. F. Doran.....	Horseshoeing.....	3 50
8	J. D. Disturnell.....	United States registers.....	25 00
8	Washington and Georgetown Railroad Company.....	Tickets.....	100 00
9	L. F. Clark.....	Window-shades.....	127 50
9	Philp & Solomon.....	Daly series.....	11 35
9	Kneessi & Norfleet.....	Harness.....	43 95
12	J. H. Soule.....	Ventilators.....	45 00
12	Adams Express Company.....	Freight.....	72 35
15	E. Rabbitt.....	Straw.....	22 12
15	B. W. Reed & Sons.....	Buckets, &c.....	87 00
15	W. H. Boyd.....	Directories.....	80 00
17	New Orleans Price Current.....	Subscriptions.....	12 50
17	New York Tribune.....	do.....	9 10
17	Columbia Railroad Company.....	Tickets.....	50 00
17	J. T. Corrigan.....	50 boxes.....	117 00
17	B. F. French.....	Books.....	38 90
20	A. G. Malloy.....	Corn.....	25 00
20	Metropolitan Railroad Company.....	Tickets.....	50 00
20	K. E. Knott.....	Files.....	14 50
20	J. H. Soule.....	Ventilators.....	15 00
20	New York Times.....	Subscriptions.....	11 00
20	W. F. Thyson.....	Cane.....	7 30
20	Yates & Wiswall.....	Linen.....	70 12
20	N. W. Burchell.....	Dusters.....	503 95
20	New York Brewers' Gazette.....	Subscription.....	5 00
21	W. W. Moore.....	Hay.....	54 90
21	S. Beiber.....	Tobacco scraps.....	2 40
21	Charles Mason.....	Serving subpoenas.....	3 10
21	A. Johns.....	Transcribing testimony.....	300 00
24	Engraving and Printing Bureau.....	Engraving seal.....	25 00
27	Harriet McKean.....	Rent of building.....	100 00
27	Franklin Telegraph Company.....	.....	31 74
27	Employés of bindery.....	Pay-roll.....	540 16
27	Employés of laundry.....	do.....	357 87
March 1	L. B. Pratt.....	Hemming towels.....	22 55
1	W. W. Moore.....	Hay.....	67 74
1	P. Sullivan.....	Care of horses.....	175 00
1	Allan Rutherford.....	Mileage.....	45 80
2	J. McDermott & Brothers.....	Repairing wagon.....	200 10
2	H. Kimmel.....	Repairing ice-pitcher.....	6 50
5	William Schooler.....	Cleaning snow.....	70 00
5	B. W. Reed & Sons.....	Mats, shovels, &c.....	26 88
5	Washington and Georgetown Railroad Company.....	Tickets.....	50 00
5	Independent Ice Company.....	Ice.....	217 44
5	Adams Express Company.....	Freight.....	60 30
5	Richard Hill.....	Care of horse.....	25 00
5	J. F. Doran.....	Horseshoeing.....	21 25
5	Boston Advertiser.....	Subscription.....	10 33
5	New York Eclectic Magazine.....	do.....	1 25
5	Catholic World.....	do.....	10 00
5	Philp & Solomon.....	Daly's series.....	11 35
5	Pittsburgh Dispatch.....	Subscription.....	8 00
5	Portland Press.....	do.....	6 83
5	Missouri Democrat.....	do.....	10 30
5	Chicago Post.....	do.....	8 75
6	New York Herald.....	do.....	10 50

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
CONTINGENT—Continued.			
1872.			
March 5	Internal Revenue Record	Subscription	\$30 00
8	H. R. Hurlburt	Mileage	257 70
8	Beall & Shoemaker	Feed	82 08
18	E. W. Woodruff	File-holders	511 67
18	Philp & Solomon	Books	23 30
18	A. J. Joyce & Co	Repairing carriage	19 75
18	S. G. Malloy	Corn	26 56
18	Walter White	Night-work	1 00
18	Franklin Telegraph Company .....	.....	93 01
19	A. Hammerschlay	Boxes	3 00
19	Boston Advertiser	Subscription	9 50
19	Internal Revenue Record	do	30 00
19	Army and Navy Journal	do	7 00
19	New York Economist	do	5 00
19	B. Westerman & Co	Books	5 25
19	G. W. Cascilear	do	500 00
20	Washington and Georgetown Railroad Company	Tickets	50 00
22	Notary's fees .....	.....	6 00
22	T. W. & J. Murphy	Horseshoeing	8 00
22	Baltimore and Ohio Railroad Company	Freight	8 39
22	A. R. Trembly	Molding	7 68
26	Engraving and Printing Bureau	Repairing Department seal	14 25
27	H. Hammerschlay	Boxes	2 50
28	Metropolitan Railroad Company	Tickets	50 00
28	Beall & Shoemaker	Feed	94 00
30	Harriet McKean	Rent of building	100 00
30	Charles Nice	File-boards	15 00
30	Employés of bindery	Pay-roll	541 91
30	Employés of laundry	do	344 29
April 1	Bodwin, Witcomb & Co	Saw-dust	2 15
1	John Bell	Sealing ships' registers	25 00
1	Western Union Telegraph Company	Telegrams	159 30
1	J. McDermott & Brothers	Repairing wagons	22 00
1	do	do	17 00
2	Washington and Georgetown Railroad Company	Tickets	50 00
2	J. Towles, agent	Rent of building	300 00
2	P. Sullivan	Care of horses	192 00
2	L. B. Pratt	Hemming towels, &c	21 75
2	T. Norfleet	Repairing harness	66 75
2	T. W. & J. Murphy	Horseshoeing	32 50
2	Independent Ice Company	Ice	239 28
2	Adams Express Company	Freight	30 50
4	J. F. Doran	Horseshoeing	7 25
4	J. H. Soule	Ventilators	60 00
4	Washington Evening Star Company	Advertising	16 00
5	G. J. Suter	Mileage	46 40
5	B. F. French	Books	10 30
5	Boston Daily Journal	Subscription	9 30
5	Detroit Daily Post	do	8 65
5	Cleveland Herald	do	8 00
5	Franco-American	do	12 00
6	Richard Hill	Care of horse	25 00
6	Washington Chronicle	Advertising	15 00
12	F. Staumb	Flower-pots	10 00
12	B. F. Stevens	Postage	46 83
12	do	do	31 40
12	do	do	22 54
17	J. H. Soule	Ventilators	180 00
17	W. H. Whitney	Mileage	118 60
22	Beall & Shoemaker	Feed	94 70
23	Yates & Wiswall	Muslin	10 45
23	L. F. Clark	Window-shades	482 05
25	B. F. Stevens	Postage	51 40
25	Franklin Telegraph Company	Telegrams	63 39
29	B. F. French	Books	15 25
29	J. M. Dermott & Brothers	Repairing wagons, &c	688 25
30	J. R. Hill	Care of horse	25 00
30	Adams Express Company	Freight	45 05
30	Western Union Telegraph Company	Telegrams	137 10
30	P. Sullivan	Care of horses	175 00
30	E. Robinson	Postage	1 05
30	Employés of bindery	Pay-roll	546 66
30	Employés of laundry	do	369 76
May 1	T. Norfleet	Mail-bags, &c	48 75
2	T. & J. W. Murphy	Horseshoeing	28 13
2	Columbia Railroad Company	Tickets	50 00
2	H. Blau	Chair-cushions	18 00

8 CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT.

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
CONTINGENT—Continued.			
1872.			
May 2	J. Coulson	Sand	\$4 00
3	H. McKean	Rent of building	100 00
3	Boston Advertiser	Subscription	8 33
3	New York Evening Post	do	1 75
3	New York World	do	9 00
3	New York Tribune	do	6 21
3	New York Evening Post	do	8 90
3	New York Bankers' Magazine	do	7 50
3	New York Evening Post	do	8 90
3	Washington Republican	do	5 67
6	Washington and Georgetown Railroad Company.	Tickets	50 00
7	Metropolitan Railroad Company	do	50 00
7	Great Falls Ice Company	Ice	178 80
8	L. B. Pratt	Hemming towels, &c	22 30
8	W. D. Wyvill	Ice chests, &c	19 00
8	Westerman & Co	Subscription	2 59
8	New York Herald	do	8 40
8	New York Evening Post	do	8 50
8	Boston Globe	do	7 50
8	J. F. Doran	Horseshoeing	2 00
9	Campbell & Armstrong	Material for bindery	363 85
9	Copper & Fry	do	232 47
11	J. Saul	Plants and seeds	49 50
14	Franklin Telegraph Company	Telegrams	73 60
14	National Republican	Subscription	31 12
14	D. W. Middleton	Books	5 00
14	P. B. Swing	Court fees	4 36
14	John Grinder	Brick	56 00
17	M. A. McGuran	Stone coping	67 80
18	J. R. Trembly	Repairing glass	10 00
20	J. Coulson	Sand	4 50
20	B. F. French	Books	54 40
23	N. C. Draper & Co	Saw-dust	2 40
24	Metropolitan Railroad Company	Tickets	50 00
24	A. L. Snowden	Mileage	28 40
24	Beall & Shoemaker	Feed	118 75
25	Steamer E. C. Knight	Freight	39 10
25	Root Steam Engine Company	Engine	1,224 00
25	G. M. Hayward & Co.	Fire-brick	70 00
31	E. W. Woodruff	File-holders	219 50
31	A. Rutherford	Mileage	46 20
31	C. Nice	Footstools	6 00
31	L. B. Middleton	Case	110 00
31	do	Boxes	120 00
31	W. D. Wyvill	Hardware	102 00
31	J. McDermott & Brothers	Repairing wagons, &c	228 00
31	H. McKean	Rent of building	100 00
31	P. Sullivan	Care of horses	175 00
31	T. W. & J. Murphy	Horseshoeing	27 12
31	Employés of bindery	Pay-roll	560 66
31	Employés of laundry	do	393 58
June 3	H. Baumgarten	Repairing stamps	14 00
3	Freedmen's Trust Company	Rent of building	236 84
4	H. Bogan	Tobacco	2 00
4	B. F. French	Books	254 82
5	Washington and Georgetown Railroad Company.	Tickets	50 00
5	J. T. Corrigan	Labor	90 00
5	R. Hill	Care of horse	25 00
5	Great Falls Ice Company	Ice	214 95
5	Franklin Telegraph Company	Telegrams	60 63
7	Adams Express Company	Freight	31 15
7	B. F. Stevens	Postage	58 47
7	George Ryneal	Glass, &c	23 03
7	Steamer John Gibson	Freight	10 10
7	L. H. Schneider	Hardware	82 30
7	New York Nation	Subscription	1 10
7	J. F. Doran	Horseshoeing	3 13
7	Yates & Wiswall	Gimp, &c	6 45
8	T. Norfleet	Repairing harness	83 75
8	Hoe Brothers	Rent of building	176 30
8	N. B. Fugitt	Lumber	20 00
10	George Ryneal	Lead, paint, &c	17 69
10	H. Ansley	Repairing clocks	12 00
10	Metropolitan Railroad Company	Tickets	50 00
10	W. H. Colein	Mileage	28 40
15	Franklin Telegraph Company	Telegrams	6 84
15	J. Kemp	Hay	48 92

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
CONTINGENT—Continued.			
1872.			
June 17	W. B. Moses	Matting, &c	\$362 00
17	B. W. Reed & Sons	Flaxseed, &c	11 50
17	E. W. Woodruff	File-holders	425 00
17	H. Hammerschlay	Boxes	3 50
18	Washington and Georgetown Railroad Company.	Tickets	50 00
18	Beall & Shoemaker	Feed	141 05
19	G. J. Suter	Mileage	46 40
19	L. Rice	Cleaning carpet	7 40
21	Washington Chronicle	Advertising	10 00
21	Wall & Co	Commission, auction sale	14 25
21	H. Baumgarten	Stamps	18 50
21	B. F. French	Books	44 95
24	Baltimore and Ohio Railroad Company.	Freight	9 15
24	W. H. Colein	Mileage	8 00
27	D. I. Saunders	Plants	60 00
27	L. F. Clark	Matting	682 00
27	Western Union Telegraph Company.	Telegrams	107 81
27	do	do	262 02
28	Washington City post-office	Postage	294 42
28	Adams Express Company	Freight	20 75
28	L. Rice	Cleaning carpets	108 70
28	J. McDermott & Brothers	Repairing wagons	883 75
28	W. H. & O. H. Morrison	Books	133 00
28	L. F. Clark	Matting	308 00
28	G. Dewitt Bro. & Co.	Wire railing	115 00
29	B. F. French	Books	360 54
29	R. Hill	Care of horse	25 00
29	T. Norfleet	Repairing harness	384 73
29	Washington and Georgetown Railroad Company.	Tickets	50 00
29	John Bell	Sealing ships' registers	125 00
29	A. C. Winslow	Labor	249 01
29	Z. D. Gilman	Disinfectant	13 70
29	H. Blau	Laying carpets	169 45
29	P. Sullivan	Care of horses	135 00
29	L. B. Middleton	Cases and shelving	360 00
29	J. B. McKay	Medical attendance on horses	10 00
29	Steamer E. C. Knight	Freight	277 38
29	Columbia Railroad Company	Tickets	50 00
29	Freedmen's Trust Company	Rent of building	1,250 00
29	B. W. Reed & Sons	Buckets, &c	309 77
29	L. B. Pratt	Hemming towels	23 90
29	H. McKean	Rent of building	100 00
29	W. D. Wyville	Baskets, &c	41 70
29	N. B. Fugitt	Lumber	159 68
29	Yates & Wiswall	Matting, &c	23 20
29	K. E. Knott	Files	15 00
29	T. W. & J. Murphy	Horseshoeing	27 25
29	R. H. Graham	Repairing carriages	134 50
29	N. W. Burchell	Brushes, &c	74 78
29	J. Towles, agent	Rent of building	300 00
29	Hoe Brothers	do	175 00
29	B. F. Stevens	Postage	52 26
29	Great Falls Ice Company	Ice	245 42
29	Employés of bindery	Pay-roll	502 66
29	Employés of laundry	do	362 34
29	Journal of Commerce	Subscription	17 50
29	Metropolitan Railroad Company	Tickets	50 00
29	Washington and Georgetown Railroad Company.	do	50 00
29	Franklin Telegraph Company	Telegrams	76 47
29	Adams Express Company	Freight	107 90
29	Baltimore and Ohio Railroad Company.	do	3 41
29	R. P. A. Denham, agent	do	10 80
29	W. H. & O. H. Morrison	Books	194 25
29	B. F. French	do	641 57
29	H. Baumgarten	Stamps	22 25
29	E. W. Woodruff	File-holders	391 16
29	Hall & Hume	Baskets	4 00
29	L. B. Middleton	Case	185 00
29	L. F. Clark	Matting, &c	168 00
29	Western Union Telegraph Company	Telegrams	209 40
29	Alta California	Subscription	18 55
29	Washington Republican	Advertising	18 00
29	Evening Star	do	8 50
29	Washington Chronicle	Subscription	5 60
29	J. L. Webster	Sealing ships' registers	100 00
29	W. McGruder	Hay	41 85

10 CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT.

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
1872. CONTINGENT—Continued.			
June 29	B. Stewart	Straw	\$18 25
29	Beall & Shoemaker	Feed	121 52
29	C. T. Smith	Building house for garden	1,695 00
29	A. C. Winslow	Labor	126 75
29	J. McDermott & Brothers	Repairing carriages	170 20
29	L. B. Middleton	Shelving	110 00
29	H. Baumgarten	Repairing stamps	19 50
29	B. W. Reed & Sons	Mirrors, soap, &c.	510 25
29	Washington and Georgetown Railroad Company.	Tickets	50 00
29	B. F. French	Books	125 62
29	do	do	157 50
29	Kneesi & Norfleet	Repairing harness	17 50
29	J. P. Bigelow	Mileage	16 00
29	R. B. Mohun & Co.	Books	212 75
29	W. B. Dana & Co.	Subscription	2 75
29	Williams & Rogers	do	19 25
29	L. B. Middleton	Watch-house platform, &c.	562 00
29	W. H. Boyd	Directories	8 50
59	Toledo Commercial Company	Advertising	6 00
29	Erie Dispatch	do	6 75
29	Buffalo Express	do	14 00
29	Fairbanks, Benedict & Co	do	11 87
29	do	do	11 87
29	George Heron	Hauling	5 00
29	W. Morris	Services as appraiser	5 00
29	J. T. Whiting	do	5 00
29	H. G. Blanchard	Services as auctioneer	25 00
29	Chicago Journal	Advertising	16 20
29	A. J. Joyce & Co.	Repairing wagons	66 68
29	J. W. McKnight	Brushes	61 25
29	L. B. Middleton	Cases	71 00
29	C. Manahan	Labor	13 92
29	J. Moriarty	Services as auctioneer	150 00
29	R. B. Mohun	Books	299 76
29	do	Material for binding	24 00
29	J. E. Scripps	Advertising	5 00
29	C. T. Smith	Building hot-bed pits, &c.	957 00
29	do	Tables in hot-bed pits, &c.	208 00
29	W. Schooler	Paving	104 40
29	Milwaukee Sentinel	Advertising	10 50
29	B. F. Stevens	Postage	84 10
29	Toledo Blade	Advertising	5 00
Total			63,053 60
1871. FUEL AND LIGHTS.			
July 13	Metropolitan Railroad	Tickets	50 00
13	Thomas Duffy	Repairing chairs	22 00
17	Yates & Wiswall	Cotton cloth	70 82
31	J. Gant	Hauling	61 25
31	Washington Gas Company	Gas	1,127 76
31	Washington Independent Gas Company	do	4 39
Aug. 2	L. F. Clark	Nails	12 00
11	J. Vermillion	Revolver	6 00
11	B. W. Reed & Son	Buckets, &c.	30 05
26	J. T. Corrigan	File-boards	304 10
29	S. S. Parker	Glass	15 00
29	Charles Nice	Gauge-boards	9 37
30	James Small	Extension-scales	2 00
30	W. D. Wyvill	Hardware	18 25
31	H. Baumgarten	Stamps, &c.	25 15
31	T. H. S. Boyd	Directories	30 00
31	L. H. Schneider	Hardware	30 32
31	Washington Gas Company	Gas	1,189 52
31	Washington Independent Gas Company	do	4 39
31	J. Gant	Hauling	67 50
31	L. H. Schneider	Hardware	88 09
Sept. 8	M. G. Copeland	Awnings	35 90
8	W. Corcoran	Stowing coal	42 90
11	do	do	23 43
11	L. W. Guinand	Wood	239 58
14	N. W. Burchell	Matches, &c.	111 55
15	H. Baumgarten	Stamps	25 40
29	W. Cocoran	Stowing coal	58 83
29	do	Sawing wood	77 13
29	B. W. Reed & Sons	Buckets, &c.	29 06
30	Kneessie & Norfleet	Harness	102 00
30	W. D. Wyvill	Hardware	120 50

CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT. 11

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
FUEL AND LIGHTS—Continued.			
1871.			
Sept. 30	E. Remington & Sons	Pistols	\$116 70
30	Washington Gas-Light Company	Gas	1,245 73
Oct. 7	Yates & Wiswall	Linen duck	85 93
13	Paul Hiser	Flower-pots	37 00
14	C. M. Stewart	Coal	5,268 51
31	Washington Gas Company	Gas	1,421 89
31	J. W. Boteler & Bro.	Brushes	51 81
Nov. 4	E. W. Woodruff	File-holders	650 00
4	J. McDermott & Brothers	Cushion for car	8 00
4	L. H. Schneider	Hardware	25 45
4	W. D. Wyvill	do	114 30
6	J. B. Dodson	Gimp	4 50
8	George Ryneal	Varnish	3 25
10	H. Baumgarten	Stamps	20 50
15	C. T. Yoder	Coal	913 22
18	Edward Lee	Stowing coal	33 00
18	Webb & Beverage	Tumblers	166 65
20	John Lyon	Labor	14 00
20	Yates & Wiswall	Merino	31 50
20	Watson Lyon	Cleaning stack	25 00
25	John T. Corrigan	File-boards	60 00
28	Henry Ansley	Repairing clock	3 75
28	E. Lee	Stowing coal	33 00
28	M. G. Copeland	Awnings	10 50
28	Mayfield & Hieston	Coal	1,476 69
Dec. 1	C. T. Yoder	do	738 72
1	E. W. Woodruff	File-holders	350 00
1	H. Baumgarten	Stamps	60 00
2	L. B. Pratt	Hemming towels	5 00
2	Z. D. Gilman	Sponge	30 00
2	E. Lee	Stowing coal	51 48
2	W. D. Wyvill	Hardware	85 50
2	Washington Gas Company	Gas	1,950 01
2	L. H. Schneider	Hardware	37 75
12	N. W. Burchell	Oil, &c	30 30
13	Michael Allen	Hauling	10 00
13	Yates & Wiswall	Canvas	29 75
13	H. Baumgarten	Stencils	4 80
13	J. Banks	Hauling	12 00
23	H. Baumgarten	Stencil	1 75
23	H. Randolph	Hauling	30 00
23	W. Coleman	Stowing coal	58 00
28	H. Baumgarten	Stamps	15 00
1872.			
Jan. 2	J. Gant	Hauling	63 12
2	Washington Gas Company	Gas	1,894 12
2	D. Butler	Labor	32 00
2	B. F. Thompson	do	30 00
2	Clement Herbert	do	46 00
2	B. W. Reed & Sons	Oil	13 57
4	Engraving and Printing Bureau	Papers, &c	27 25
6	W. D. Wyvill	Hardware	45 40
7	H. Randolph	Hauling	55 00
10	L. H. Schneider	Hardware	22 26
12	A. Girvin	Laborer	14 00
16	H. Randolph	Hauling	15 00
18	A. H. Paul	Carpentering	33 00
18	Thomas Hurdle	do	39 00
18	William Diggs	do	36 00
20	H. Baumgarten	Stamps, &c	21 90
20	Robert Evans	Laborer	16 00
20	Engraving and Printing Bureau	Heating cabinet-shop	22 65
26	John Lyon	Laborer	12 25
26	Charles Nice	Boxes	2 00
26	John T. Corrigan	File-boards, &c	109 65
27	James O. Hagan	Repairing gas-pipe	2 50
Feb. 1	Benjamin Thompson	Laborer	62 00
1	John Russell	do	60 00
1	John T. Kelly	do	10 00
1	David Butler	do	62 00
1	John Evans	do	46 00
1	A. Garvin	do	32 00
1	Clement Herbert	do	62 00
1	Samuel Mulligan	do	10 00
1	John Myers	Hauling	50 00
1	Jerry Gant	do	65 62
1	J. McDermott & Brothers	Wheelbarrows	59 00
5	W. D. Wyvill	Stove, &c	58 75

12 CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT.

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
1872.	FUEL AND LIGHTS—Continued.		
Feb. 5	Washington Gas Company.....	Gas	\$1, 878 87
5	L. H. Schneider	Hardware	70 12
5	W. B. Reed & Sons.....	Feather-dusters	64 28
9	John Ramsell	Laborer	20 00
9	John D. Kelly.....	do	20 00
13	John Myers.....	Hauling	72 00
14	George Ryneal.....	Brushes and oil.....	19 10
17	Clement Herbert.....	Laborer	20 00
17	John Evans.....	do	20 00
17	A. Garvin.....	do	20 00
17	David Butler.....	do	20 00
20	Benjamin Thompson.....	do	30 00
20	N. W. Burchell.....	Oil, &c	9 85
24	H. Baumgarten	Stamps	38 08
March 1	David Butler.....	Labor	38 00
1	Christian Bowers	do	52 00
1	John Evans	do	38 00
1	Alexander Garvin	do	24 00
1	Clement Herbert	do	38 00
1	A. Ramsdell	do	38 00
1	B. F. Thompson	do	28 00
1	John Myers.....	Hauling	60 00
1	W. D. Wyvill.....	Hardware	52 50
1	E. W. Woodruff.....	File-holders	283 33
2	J. McDermott & Brothers.....	Repairs and wheelbarrow	32 75
2	Jerry Gant.....	Hauling	61 62
4	L. H. Schneider	Hardware	37 75
4	Washington Gas Company.....	Gas	1, 535 32
7	W. Evans	Labor	10 00
7	John Ramsdell.....	do	10 00
7	Charles Nice.....	File-boards	21 00
15	D. Butler.....	Labor	30 00
15	Clement Herbert.....	do	30 00
15	B. F. Thompson	do	30 00
23	John T. Corrigan.....	Boxes, &c	29 75
26	Western Union Telegraph Company		114 72
30	John Myers	Hauling	147 00
April 1	J. McDermott & Brothers	Painting signs.....	14 00
1	H. Baumgarten	Stamp	37 50
1	B. F. Thompson	Labor	32 00
1	D. Butler	do	32 00
1	C. Herbert	do	32 00
2	J. Gant	Teaming	63 75
2	W. D. Wyvill.....	Hardware	241 25
3	Washington Gas Company.....	Gas	1, 623 07
10	J. E. Miller.....	Wood	89 90
11	E. W. Woodruff.....	File-boxes	623 80
16	D. Butler.....	Labor	30 00
16	B. F. Thompson	do	30 00
16	C. Herbert	do	30 00
17	Washington and Georgetown Railroad Company.....	Tickets	50 00
18	Z. D. Gilman	Brushes and combs.....	65 75
30	C. Herbert	Labor	30 00
30	B. F. Thompson	do	30 00
30	D. Butler	do	30 00
30	John Myers.....	Teaming	80 00
30	J. Gant	do	65 00
30	Webb & Beveridge	Spittoons.....	40 00
30	H. Baumgarten	Stamps	47 60
30	D. J. McCabe	Alcohol.....	97 88
30	J. T. Corrigan	File-boards and stools	26 00
May 3	J. Myers.....	Teaming	60 00
3	L. H. Schneider	Hammer	6 38
3	Washington Gas Company.....	Gas	1, 412 15
8	E. W. Woodruff.....	File-boards	443 36
18	B. F. Thompson	Labor	30 00
18	C. Herbert	do	30 00
31	M. G. Copeland.....	Awnings	55 00
31	J. McDermott & Brothers.....	Iron work.....	10 00
31	Jerry Gant	Teaming	64 37
31	C. Herbert	Labor	28 00
31	D. Butler	do	28 00
31	B. F. Thompson	do	30 00
31	Dennis Mulligan.....	Sawing wood.....	52 00
31	John Myers.....	Teaming	42 00
June 4	Washington Gas Company.....	Gas	1, 303 14
14	C. Herbert	Labor	20 00
17	H. Kimmel.....	Repairing pitcher	6 00
18	B. Waynes	Charcoal.....	7 60

CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT. 13

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
FUEL AND LIGHTS—Continued.			
1872.			
June 18	R. Clarkson	Laying brick	\$37 50
21	L. B. Middleton	Making cases	760 00
21	American Sanitary Association	Carbolic powder	26 56
28	Webb & Beveridge	Shades, burners, and stands	110 65
28	J. H. Haskell	Belting	143 27
28	A. R. Shepherd & Co.	Gas-fixtures	64 42
28	Bartlett, Robins & Co	Pump and lubricator	304 00
29	Somerville & Leitch	Plumbing and gas-fitting	45 60
29	J. Gant	Hauling	60 00
29	M. G. Copeland	Awnings	63 00
29	W. D. Wyvill	Engine-work	59 30
29	George Ryneal	Chamois-skin	27 00
29	Gray & Noyes	Engine and shafting	1,994 10
29	Charles Stott & Co	Camphor and candles	148 00
29	H. H. Hempler	Thermometers	16 00
29	J. W. Boteler & Bro	Matches and coolers	616 37
29	N. W. Burchell	Oil	7 00
29	Washington Gas Company	Gas	1,189 84
29	Henry Sievers	Iron railing	58 50
29	W. D. Wyvill	Dusters	786 25
29	J. S. Bruner	Oil and tripoli	163 19
29	Yates & Wiswall	Terry cloth	165 23
29	L. H. Schneider	Hardware	1,443 86
29	W. B. Moses	Scoops	66 00
29	N. W. Burchell	Soap and brooms	398 51
29	Utica Steam Gauge Company	Patent gauge	250 00
29	W. D. Wyvill	Hardware	3 00
29	George Ryneal	Shellac and alcohol	286 06
29	W. G. Maxwell	Belting and hooks	61 17
29	J. C. Hogan	Covering engine-pipe	78 00
29	J. W. McKnight	Soap and buckets	720 50
29	John A. Baker	1 platform-scale	350 00
29	James Small	Sealing-scales	10 00
29	W. H. Godey	Lime and cement	31 20
29	H. H. Hempler	Thermometers	25 00
29	Gray & Noyes	Machinery	244 20
29	Potter & Hoffman	Steam-gauge	88 15
29	H. Baumgarten	Silver-plate for engine	17 50
29	Charles Stott & Co	Concentrated lye	69 00
29	J. W. Boteler & Bro	Clothes-racks	11 25
29	J. L. Savage	Lanterns and sponge	177 86
Aug. 29	L. H. Schneider	Awning hooks and keys	33 18
Sept. 11	do	1 gross picture-nails	1 65
12	B. W. Reed & Sons	Spittoons	84 75
28	J. McDermott & Bro	Furnace tools	126 50
Oct. 26	L. H. Schneider	Argand chimneys	16 60
Nov. 12	do	Stock and die	6 50
	Total		46,048 98
FURNITURE AND CARPETS.			
1871.			
July 17	G. M. Wight	Furniture	186 00
28	Daniel Smith	Turning for cabinet	38 37
31	Employés, cabinet-shop	Pay-roll	902 00
Aug. 31	J. B. Dodson	Oil-cloth	52 19
31	T. W. Thyson	Caue	18 98
31	E. W. Woodruff	File-holders	140 00
31	Henry Ansley	Clock-spring	3 00
31	J. W. McKnight	Tables	40 00
31	Employés, cabinet-shop	Pay-roll	1,026 25
Sept. 10	F. W. Kassack	Turning for cabinet	60 50
10	Baltimore and Ohio Railroad Company	Freight on carpets	11 32
26	Daniel Smith	Turning for cabinet	10 49
26	John T. Corrigan	Pigeon-hole case	479 00
27	W. & J. Sloane	Carpets, &c	59 98
30	do	do	1,711 94
30	S. J. Fagan	Wheel for cabinet	2 00
30	Employés, cabinet-shop	Pay-roll	1,313 87
Oct. 4	L. F. Clark	Cord and tassels	10 00
4	H. Blan	Laying carpets	124 43
7	W. S. Mitchell	Matting, &c	406 00
13	W. B. Moses	Table	50 00
14	M. G. Copeland	Awnings	3 50
16	John T. Corrigan	Table	15 00
16	Daniel Smith	Turning for cabinet	40 76
17	George Ryneal	Varnish, &c	14 75
19	J. & J. Williams	Veneer	32 50
19	Employés, cabinet-shop	Pay-roll	1,184 75

14 CONTINGENT EXPENSES OF THE TREASURY DEPARTMENT.

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
FURNITURE AND CARPETS—Continued.			
1871.			
Nov. 3	H. Blau	Laying carpets	\$155 60
4	L. H. Schneider	Mortising-machine	55 00
4	N. B. Fugitt	Lumber	219 30
4	Charles Nice	Shelving	95 00
9	W. & J. Sloane	Carpets	915 50
13	L. B. Middleton	Cases	350 00
17	W. B. Moses	Cloth	8 75
20	F. W. Kassack	Carving handles	12 20
20	Baltimore & Ohio Railroad Company	Freight on carpets	6 24
21	W. B. Moses	Chairs, &c	204 00
21	Supervising Architect	Boxes and repairs, &c	578 06
24	W. & J. Sloane	Carpets	701 10
25	S. M. Plumley & Bro	Case	35 00
30	Employés, cabinet-shop	Pay-roll	1,290 35
Dec. 2	W. & J. Sloane	Rugs	75 66
4	H. Blau	Laying carpets	303 33
8	L. B. Middleton	Money-order boxes	700 00
8	Charles Nice	Shelving, &c	100 65
8	John T. Corrigan	File-boards, &c	214 25
8	F. W. Kassack	Carving	15 00
9	G. M. Wight	Chairs	324 00
9	L. H. Schneider	Screws	4 70
9	Frost, Black & Co	Desk	165 00
9	Daniel Smith	Turning	17 60
18	W. S. Mitchell & Co	Oil-cloth, &c	109 50
22	M. A. Walter	Cushion	2 15
28	N. B. Fugitt	Lumber	116 00
28	J. B. Dodson	Gimp	4 50
28	Steamship Gibson	Freight	9 50
28	W. & J. Sloane	Carpets	211 41
31	H. Blau	Laying carpets	118 50
31	Employés, cabinet-shop	Pay-roll	1,313 17
1872.			
Jan. 4	Engraving and Printing Bureau	Guide-bars	3 50
5	Baltimore and Ohio Railroad Company	Freight	7 51
10	L. H. Schneider	Hardware	3 15
10	Daniel Smith	Turning	3 70
13	Yates & Wiswall	Blue cloth	117 00
23	Engraving and Printing Bureau	Press-rods	2 60
23	W. B. Moses	Furniture	263 00
25	L. B. Middleton	Book-case, &c	74 00
25	Yates & Wiswall	Canvas	20 00
31	H. Blau	Cushions	72 00
31	N. B. Fugitt	Lumber	151 26
31	W. & J. Sloane	Rugs	140 14
31	Employés, cabinet-shop	Pay-roll	1,423 42
31	H. Blau	Laying carpets	97 58
Feb. 5	L. H. Schneider	Hardware	15 90
6	W. & J. Sloane	Carpets	538 35
7	Daniel Smith	Turning	2 30
7	Thompson & Co	Drilling	46 37
7	N. C. Draper & Co	Sawing	2 25
15	Frost, Black & Co	Chairs	477 00
15	New York and Washington Steamship Company	Freight	55 41
20	F. Kassack	Carving	33 00
20	M. A. Walter	Cushion	1 00
23	W. & J. Sloane	Carpets	229 15
24	Baltimore and Ohio Railroad Company	Freight	17 44
29	Supervising Architect	Repairs	12 25
29	do	Boxes, &c	76 15
29	Employés, cabinet-shop	Pay-roll	1,283 98
March 2	J. McDermott & Brothers	Lumber	12 00
2	Yates & Wiswall	Canvas	38 00
2	H. Blau	Laying carpets	111 50
4	L. H. Schneider	Hardware	11 50
7	J. B. Dodson	Gimp	9 00
7	F. W. Kassack	Carving	22 00
7	W. F. Thyson	Cane	14 60
15	W. & J. Sloane	Carpets	435 10
15	do	do	92 71
15	do	Carpet-sewing	126 00
18	do	Carpets	475 18
23	do	Rugs and mats	124 26
30	Employés, cabinet-shop	Pay-roll	1,585 15
April 2	H. Blau	Repairing and laying carpets	165 27
5	N. B. Fugitt	Lumber	263 56
6	W. F. Thyson	Cane	14 60
10	Supervising Architect	Sharpening knives	34 12

Expenses of the Treasury Department, &c.—Continued.

Date.	Name.	Article.	Amount.
FURNITURE AND CARPETS—Continued.			
1872			
April 10	W. & J. Sloane	Carpet	814 75
1	Yates & Wiswall	Gimp and canvas	32 50
1	J. McDermott & Brothers	Iron work	21 75
2	L. H. Schneider	Hardware	16 60
11	John Fitzhugh	Cases and shelving	190 00
12	W. & J. Sloane	Rugs	64 68
17	Daniel Smith	Sawing and turning	14 68
17	do	do	2 95
18	William S. Mitchell & Co	Matting and oil-cloth	194 00
23	Yates & Wiswall	Muslin, canvas, and gimp	156 25
23	F. Kassack	Carving	40 00
26	L. B. Middleton	2 file-cases	350 00
26	J. McDermott & Brothers	Screen-irons	9 75
30	Employés, cabinet-shop	Pay-roll	1,463 29
May 1	M. A. Walker	Making cushions	2 50
2	M. G. Copeland	Awnings	524 26
2	H. Blau	Making and laying carpets	108 57
3	L. B. Middleton	3 cases	125 00
3	L. H. Schneider	Hinges, &c	9 80
8	W. F. Thyson	Cane	14 60
14	Thompson & Co	Drilling	43 20
14	Daniel Smith	Sawing and turning	16 87
25	C. B. Rogers & Co	Machinery	1,259 05
31	H. Blau	Making and laying carpets	175 55
31	J. McDermott & Brothers	Plank	6 10
31	Employés, cabinet-shop	Pay-roll	1,803 28
June 4	W. F. Thyson	Cane	29 20
5	N. B. Fugitt	Lumber	101 60
7	George Ryneal	Varnish and oil	72 45
7	L. H. Schneider	Tacks and screws	53 60
7	W. L. Mitchell & Co	Oil-cloth	157 07
7	Yates & Wiswall	Canvas, &c	37 00
7	D. Smith	Sawing and turning	43 15
10	George Ryneal	Wood-filling and varnish	16 25
17	W. B. Moses	Cloth	23 21
17	G. M. Wight	Chairs and cushions	221 00
20	Thompson & Co	Hair and drill	29 02
28	J. McDermott & Brothers	Iron-work	11 00
28	Bruce, Daniels & Rupp	Mahogany	258 81
28	Willard, Hawes & Co	do	204 68
29	Graham, Dorsett & Co	do	984 93
29	J. & F. Copcutt	do	895 25
29	G. W. Read & Co	do	1,492 87
29	W. D. Wyvill	Glue	87 60
29	Charles Nice	Table	6 00
29	W. F. Thyson	Cane	73 00
29	Meller & Orme	Machinery	229 55
29	Gray & Noyes	Shafting and pulley	1,031 21
29	Yates & Wiswall	Canvas and cloth	1,216 82
29	L. B. Middleton	Table	90 00
29	Employés, cabinet-shop	Pay-roll	1,300 85
29	F. W. Kassack	Carving	37 50
29	Thompson & Co	Hair and drill	205 00
29	D. Smith	Sawing and turning	4 90
29	Supervising Architect	Sharpening knives	25 80
29	C. T. Smith	Shelving	185 00
29	W. B. Moses	Chairs and matting	332 40
29	N. B. Fugitt	Lumber	2,455 77
29	J. W. McKnight & Co	Chair-cushions	216 00
29	G. M. Wight	Chairs and stools	45 00
29	Gray & Noyes	Machinery	905 89
29	C. B. Rogers & Co	do	889 15
29	J. W. McKnight	Chairs	1,068 00
Sept. 16	W. & J. Sloane	Carpets	2,505 80
Oct. 12	do	do	1,065 39
Nov. 20	do	do	294 61
			50,634 87
	Refunded, as per warrants		718 09
			49,916 78

REMOVAL OF GREAT AND LITTLE OSAGE INDIANS.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

RELATIVE TO

An appropriation of \$1,240,000 for the removal of the Great and Little Osage Indians from Kansas, in conformity to law and treaty stipulations.

FEBRUARY 8, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., February 4, 1873.

SIR: In conformity to law and treaty stipulations, the Great and Little Osage Indians have been removed from Kansas and located upon lands in the Indian Territory, ceded by the Cherokees, under the treaty of 19th July, 1866, for the settlement of friendly Indians.

The area of country selected for the Osages is, in the absence of plats of survey, estimated to contain 1,650,529 acres; and, in order that the Cherokees may be paid for the land thus occupied by the Osages, it will be necessary that an amount sufficient for the purpose should be transferred from the moneys received from the sale of the Osage lands to the credit of the Cherokees, and the sum be placed at the disposal of the Secretary of the Interior, to be invested as is provided in the twenty-third article of the treaty aforesaid.

I have the honor to transmit herewith a copy of a report, dated the 29th ultimo, from the Acting Commissioner of Indian Affairs, which presents a statement of the facts in the case, together with an amendment to the appropriation bill now pending before Congress—the same to be inserted after line 963 of said bill, as it passed the Senate—which is considered necessary to enable this Department to comply with the provisions of the twenty-third article of the treaty referred to.

I will remark while it is believed the sum of \$1,240,000 will be sufficient for the purpose, the amount named in the amendment submitted by the Acting Commissioner was not changed, as the language, “or so much thereof as may be necessary,” will restrict the Department to the specific amount required, when the exact area of the tract and the price to be paid therefor are determined and fixed.

Very respectfully, your obedient servant,

C. DELANO,
Secretary.

To the SPEAKER
of the House of Representatives.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., January 29, 1873.

SIR: I have the honor to state that the Cherokee treaty of 1866, (Stat. at Large, vol. 14, p. 799,) ceded to the United States, for the settlement of friendly Indians, all the lands of the Cherokees west of the 96th meridian. The 12th section of the act of Congress approved June 15, 1870, (Stat. at Large, vol. 16, p. 362,) provided for the sale of the Osage lands in Kansas, the removal of these Indians to homes in the Indian Territory on the Cherokee ceded lands, and the payment out of the proceeds of the sale of the said lands in Kansas for the lands thus to be occupied by the Osages in the Indian Territory. The act of Congress approved June 5, 1872, (Stat. at Large, pamp. ed., p. 228,) confirmed to the Great and Little Osages that portion of the Cherokee lands referred to in said treaty of 1866, lying between 96° west longitude and the Arkansas River.

The number of acres thus confirmed cannot now be definitely ascertained, in the absence of some of the plats of survey, but the area, as nearly as can be, is estimated at 1,650,529.03 acres, which, at the rate of one dollar per acre, (which is probably as high a rate as will be decided upon,) would amount in round numbers to \$1,650,600, a sum that will be sufficient to make payment for the same.

That the Cherokees may receive pay for the lands thus sold to the Osages, it will be necessary that said sum of \$1,650,600, or as much thereof as may be required, should be transferred from the amount received for the sale of the Osage lands, as aforesaid, to the credit of the Cherokees, and this sum placed at the disposal of the Secretary of the Interior, to enable him to invest the sum as provided in the 23d article of said Cherokee treaty of 1866.

I have, therefore, caused to be prepared and inclosed herewith an amendment to the Indian appropriation bill now pending before Congress, the same to be inserted after line 963 of said bill as it passed the Senate, and respectfully recommend that the same be laid before that body for its favorable consideration and action.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

Provided, That the Secretary of the Treasury is hereby authorized and directed to transfer from the proceeds of sale of the Osage Indian lands in Kansas, made in accordance with the twelfth section of the act of Congress approved July fifteenth, one thousand eight hundred and seventy, the sum of one million six hundred and fifty thousand six hundred dollars, or so much thereof as may be necessary, and to place the same on the books of his Department to the credit of the Cherokee Indians, in accordance with the act of Congress approved June fifth, one thousand eight hundred and seventy-two, entitled "An act to confirm to the Great and Little Osage Indians a reservation in the Indian Territory," and the acts of Congress and treaties therein mentioned and referred to, whenever the amount to be so transferred shall be certified to the said Secretary of the Treasury by the Secretary of the Interior. And the Secretary of the Interior is hereby authorized to draw from the Treasury, by requisition in due form, the amount so transferred, and invest the same in United States registered stocks, in accordance with the provisions of the twenty-third article of the Cherokee treaty of July nineteenth, one thousand eight hundred and sixty-six.

PUBLIC BUILDING AT SAINT JOSEPH, MISSOURI.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

RELATIVE TO

The erection of a public building at Saint Joseph, Missouri.

FEBRUARY 8, 1873.—Referred to the Committee on Public Buildings and Grounds
and ordered to be printed.

TREASURY DEPARTMENT,
Washington, D. C., February 1, 1873.

SIR: I have the honor to acknowledge the receipt of the following
resolution:

On motion of Mr. Isaac C. Parker,

Resolved, That the Secretary of the Treasury be, and he is hereby, requested to inform the House of the necessity for the erection of a public building at Saint Joseph, Missouri, to be used by the United States Government as a post-office, custom-house, internal-revenue office, and United States circuit and district court rooms; also, the probable cost of the same, and the opportunity of obtaining material for the erection of the same in Missouri or Kansas.

And have to say, in reply, that the Department is not in possession of any information that would warrant it in making a specific recommendation on the points covered by the resolution.

The Department is now paying rent for the premises occupied by the internal-revenue officers, at the rate of \$600 per annum, and is informed that the Post-Office Department is paying rent for the post-office, at the rate of \$1,000 per annum.

The Department is not in possession of any information as to the facilities for obtaining building-materials in that section of the country.

Very respectfully,

GEO. S. BOUTWELL,
Secretary.

Hon. JAMES G. BLAINE,
Speaker House of Representatives.

THE SECRETARY OF THE TREASURY

Washington, D. C., January 1, 1892.

Dear Sir:

I have the honor to acknowledge the receipt of your letter of the 29th inst.

in relation to the proposed amendment to the National Currency Act, and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.

I am, Sir, very respectfully,
Your obedient servant,
J. M. [Signature]

Very respectfully,
J. M. [Signature]

42D CONGRESS, }
3d Session. }

HOUSE OF REPRESENTATIVES.

{ Ex. Doc.
{ No. 185.

REPORT

ON THE

INTERNATIONAL PENITENTIARY CONGRESS

OF

LONDON,

HELD JULY 3-13, 1872.

By E. C. WINES, D. D., LL. D.,

UNITED STATES COMMISSIONER.

TO WHICH IS APPENDED

THE SECOND ANNUAL REPORT OF THE NATIONAL PRISON ASSOCIATION
OF THE UNITED STATES, CONTAINING THE TRANSACTIONS
OF THE NATIONAL PRISON REFORM CONGRESS,
HELD AT BALTIMORE, MARYLAND,
JANUARY 21-24, 1873.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1873.

REPORT

OF THE

NATIONAL BUREAU OF INVESTIGATION

CONDUCTED BY

JOHN EDGAR HOOVER

BY J. C. WOODS, D. C.

CHIEF OF BUREAU

IN CONNECTION WITH

THE SPECIAL AGENT REPORT OF THE NATIONAL BUREAU OF INVESTIGATION
ON THE CASE OF THE NATIONAL BUREAU OF INVESTIGATION
HOLD AT BUREAU OF INVESTIGATION
JANUARY 1913

WASHINGTON

GOVERNMENT PRINTING OFFICE
1913

To the Senate and House of Representatives :

I transmit herewith a report from the Secretary of State and accompanying papers.

U. S. GRANT.

WASHINGTON, *February* 13, 1873.

DEPARTMENT OF STATE,
Washington, February 13, 1873.

Referring to the joint resolution of Congress, of the 20th March, 1871, authorizing the appointment, by the President, of a commissioner to attend an International Congress on Penitentiary and Reformatory Discipline, proposed to be held in Europe, I have the honor to transmit herewith the report of Mr. E. C. Wines, appointed under the said resolution, of the congress which was held at London, together with an appendix containing a summary of the proceedings of the late National Prison Congress of Baltimore.

Respectfully submitted.

HAMILTON FISH.

The PRESIDENT.

WASHINGTON, *February* 12, 1873.

SIR: I have the honor to submit to you my report as Commissioner of the United States to the International Penitentiary Congress of London, together with an appendix, containing summary of proceedings of the late National Prison Congress of Baltimore.

With great respect, I have the honor to be, your most obedient servant,
E. C. WINES,
Commissioner, &c.

His Excellency U. S. GRANT,
President of the United States.

H. EX. 185—*

To the Senate and House of Representatives
I transmit herewith a report from the Secretary of State and upon
pending papers.

U. S. GRANT

WASHINGTON, February 12, 1875.

DEPARTMENT OF STATE,
Washington, February 12, 1875.
Referring to the Joint resolution of Congress, of the 20th March,
1871, authorizing the appointment, by the President, of a commission
to attend an International Congress on Penitentiary and Reformatory
Discipline, proposed to be held in Europe, I have the honor to transmit
herewith the report of Mr. M. O. Wines, appointed under the said res-
olution, of the Congress which was held at London, together with an
appendix containing a summary of the proceedings of the late National
Prison Congress of Baltimore.
Respectfully submitted,

HAMILTON SMITH

The President.

WASHINGTON, February 12, 1875.
Sir: I have the honor to submit to you my report as Commissioner
of the United States to the International Penitentiary Congress of Lon-
don, together with an appendix, containing summary of proceedings of
the late National Prison Congress of Baltimore.
With great respect, I have the honor to be, your most obedient servant.

M. O. WINES,
Commissioner.

His Excellency U. S. GRANT,
President of the United States.

H. H. 1875

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REPORT.

GENERAL INTRODUCTION.

The Congress of London has passed into history. It is a fixed fact, irrevocable and unchangeable. It only remains to tell its story and gather its fruits. The first is simple, and may be quickly done; the last will be manifold, and the harvest, it may be hoped, will be gathering for years, if not for generations, to come.

In a paper read by M. Charles Lucas before the French Academy prior to the meeting of the congress, it was well remarked by that eminent and venerable man :

International congresses have been too often repeated in our day to be looked upon as facts purely accidental. There is a reason for their existence. They are the necessary consequence of the two laws of the sociability and perfectibility of man, which, at the present advanced stage of our civilization, demand the international exchange of ideas to promote the moral progress of humanity, as they do that of material products to advance the public wealth. Such congresses serve to show the condition of different nations as regards their intellectual development, in the same manner as industrial exhibitions show the comparative results of their economic development. Hitherto there have been convened congresses of governments and congresses of citizens. The first have already done good service, and it is desirable to increase their importance and their frequency in international and diplomatic relations. The second play the part of generous satellites of civilization, which, that they may give light and direction to its progress, rush to the front, sometimes rather precipitately and not in the most perfect order, but always affording a useful stimulus to human development. What stamps upon the Congress of London a character of complete originality is that it is entitled, and, in effect, is to be, a *semi-official* conference, combining the initiative of governments and of individuals. The circumstance most remarkable about it is that this semi-official character has been given to the congress by a government heretofore least disposed to interfere, in the slightest degree, with the free initiative of individuals and associations, and by a people least inclined to tolerate such interference.

This analysis of the elements composing the Congress of London is perfectly just. The congress was opened on the evening of the 3d of July, in the great hall of the Middle Temple, with an address by the right honorable the Earl of Carnarvon, a nobleman profoundly versed in penitentiary science and thoroughly active in the work of penitentiary reform. The address was able, terse, and practical—one of those model productions which give, with a Doric simplicity, “the essences of things.” Every sentence went straight to the mark; every paragraph was marked by good sense; and the whole discourse, drawn from “the well of English undefiled,” held the vast assemblage spell-bound to the end.

At the conclusion of the address Lord Harrowby offered a resolution of welcome to the foreign delegates, which was seconded by Sir Charles Adderly; and both gentlemen gave expression, in well-conceived thoughts and happy phrase, to the sentiment of hospitality with which England received the members of the congress coming from other countries.

Baron Von Holtzendorff, on behalf of the continental delegates, and the Hon. Joseph R. Chandler, on behalf of the delegates from America, replied to the welcome in terms no less graceful and eloquent than those in which it had been conveyed.

The undersigned would here respectfully submit to the President his appreciation of the character, work, and probable results of the Congress of London.

1. Twenty distinct nationalities were represented in the congress by delegates bearing commissions from their respective governments; in some cases one representative only being so commissioned, in others several. In addition to the national representatives from the United States and the German Empire, fifteen States of the former and five of the latter were also officially represented; some of them, as in the case of nationalities, by a single delegate, others by a plurality. The same was true of several of the larger of the colonial possessions of England; as, for example, India and Australia. So that altogether the number of official members with commissions from governments, could not have been less than sixty, and might have reached, and probably did, to seventy. This is a great fact, quite unprecedented in the annals of penitentiary reform.

2. Besides official members, numerous delegates were present with commissions from national committees, prison societies, managing boards of penitentiary and reformatory establishments, societies of jurists, criminal-law departments of universities, and last, though not least, the Institute of France, the most illustrious body of *savans* in the world. Between official and non-official members, that is, delegates commissioned by governments and delegates commissioned by such organizations as those named in the preceding sentence, the congress must have numbered not much, if any, less than four hundred members.

3. If the congress was conspicuous by the number of its members and of the governments and organizations represented, it was no less conspicuous by their ability and thorough mastery of the questions which engaged its study. It was a reunion of specialists—men and women largely devoted to prison-work, whether in the investigation of the principles of penitentiary science or in their practical application—and embodying, representatively, the knowledge, experience, and wisdom of the world on the subjects to which its labors were dedicated.

4. It is much that the thinkers and workers in this great cause have met in council; that they have looked into each other's faces; that they have grasped hands; and that they have felt their hearts beating, as it were, one against the other. Sympathies have thus been awakened and friendships formed, from which precious fruits will be gathered. All will go back to their respective fields, to work with greater earnestness and higher hope from the strength and courage received from such communion. Valuable correspondence and the interchange of mutually instructive documents cannot fail to be among the useful results of the acquaintances formed at this great international gathering. Another benefit will be a far more extensive international visitation of prisons; and from this will come, on the one side, a large influx into the different countries of new and in many cases fruitful ideas, and, on the other, a great diminution, if not a complete obliteration, of international prejudices.

5. An amount of information on the penitentiary and reformatory systems of different countries and their results, never, I think, heretofore collected, and certainly never before presented in one view, is among the most precious results of this congress. The greater part of the governments represented handed in carefully-prepared official reports in response to a series of questions submitted to them by the undersigned, and the information thus offered, wide and valuable as it is,

was most usefully supplemented by facts communicated and statements made by delegates on the floor of the congress. It would be difficult to exaggerate the value of such a mass of information, coming, as it does, from the most authentic sources, and, by consequence, clothed with an authority with which it could not have been otherwise invested.

6. The vast fund of precious information thus accumulated will be diffused, through the agency of the congress, to the utmost limits of civilization. It is to be presumed that the official delegates will all make reports to the governments by which they were commissioned, all of which reports will, no doubt, be published among the archives of the governments to which they are made, and will thus not only be circulated among the people of all civilized countries, but will come under the special notice of the makers and executors of the laws of those countries.

But this is not all. The numerous non-official delegates will, beyond a doubt, in a thousand different forms and through as many several channels, make report of the doings of the congress to their respective constituencies; and the press of all nations—so keen in its scent of news, so prompt to catch and crystallize all forms of thought, so potent for good as well as for evil, and, to its praise be it said, so ready, in the main, to lend its powerful aid to every worthy cause—will echo and re-echo these many voices to the very ends of the earth. What imagination can grasp the amount of good which will, in this infinite variety of ways, be accomplished through the congress, or forecast the progress thence likely to result in a department of social science second in importance to no other in the whole field of social investigation?

7. The congress has given, or is destined to give, an immense impulse to the cause of prison-reform. On this point it is enough to refer to what has been written above, and to state that the evidences of a newly-awakened interest in penitentiary questions, and of a strengthened purpose to seek their just solution, are visible on every side.

8. It is not to be disguised that the summoning of such an assemblage as that of the late Congress of London was a hazardous experiment. It was, from the start, encompassed with dangers as well as difficulties; and a peril far from inconsiderable, and awakening no little anxiety, and even some alarm in my mind, developed itself in the progress of its labors. Representatives from more than twenty different nationalities, coming together literally from the ends of the earth, for the study of problems at once so important and so perplexed as those comprehended in the field of penitentiary science, could not fail to develop a good deal of difference of opinion, which might become so sharp as to end in a violent disruption of the body. This is the peril referred to above as having actually presented itself—rather, however, to those who were more in the inner circle than to the ordinary observer. But by moderation and prudence the danger was averted, and the congress was, in the end, able to announce a series of propositions of the highest importance, embodying its conception of the cardinal principles of prison discipline. They are substantially those adopted by the Congress of Cincinnati, in 1870. This was a great result; and the whole world may, it seems to me, be congratulated on such a conclusion to the labors of the Congress of London. The propositions announced will enter as seed into the public opinion of the world, and can hardly fail, in due time, to make themselves felt in improved systems of criminal law and prison discipline. Indeed, Professor Marquardsen, of Bavaria, a distinguished member of the German Parliament, publicly declared his conviction that the new penal code for the German Empire, now under consideration

by the Parliament, would be materially improved through the labors of the congress.

9. The congress will have made a contribution of great value to the literature of penology. Its volume of transactions will embody: 1, the official reports of governments on the penitentiary systems and administrations of their respective countries; 2, the discussions had on the numerous and important questions which came before the body for its consideration, taken down at the time by competent reporters; 3, the papers submitted to the congress by distinguished specialists in different countries, most of them of remarkable ability, breadth, and power.

10. Another admirable result of the congress is the creation of a permanent international committee, charged with important functions in the interest of international prison reform, and more particularly with the duty of seeking to secure greater uniformity and trustworthiness in international prison statistics. The committee is constituted as follows: Dr. Wines, United States, chairman; Signor Beltrani-Scalia, Italy, secretary; Mr. G. W. Hastings, England; M. Loyson, France; Dr. Guillaume, Switzerland; Mr. Stevens, Belgium; Mr. M. S. Pols, Netherlands; Dr. Frey, Austria; Count Sollohub, Russia; and Baron Von Holtzendorff, Germany. This committee will hold its first annual meeting in Brussels, Belgium, in the month of September, 1873. Doubtless one of the most important questions that will then come before the committee will be that of calling another international penitentiary congress, and if that question be decided affirmatively, the duty will arise of fixing the time and place for holding it, and of determining the bases on which it shall be organized and conducted. It may be hoped that this committee will form a kind of central bureau, to which intelligence relating to prison reform, and the progress made therein, will be communicated, year by year, from all parts of the world, and from which, in a condensed and digested form, it will be again distributed to every region of the globe. Thus every part of the world will be kept informed of what is doing in every other part in reference to this vital interest of society. In this way a continual circulation of ideas on penitentiary questions will be maintained; the nature and result of experiments undertaken in any given country will be speedily made known in every other; and an honorable rivalry will be kept up between nations, in which each, while rejoicing in every instance and at every proof of progress elsewhere, will yet strive to outstrip its fellows in the race of improvement.

11. Three great national commissions have already grown, not, indeed, out of the congress, but out of the movement for the congress, having been created before the body itself assembled, but not before the proposition for it had been submitted to the governments by which the commissions have been inaugurated. The first is a royal commission for Italy, named by the King last autumn, on a report submitted to him by the prime minister, Mr. Lanza, after an interview had with him by the undersigned, and expressly based on what passed at that interview. The second is a legislative commission for France, created by the National Assembly, in pursuance of a report submitted to that body by the Viscount d'Haussonville and an act passed on his motion early last winter. The distinguished member avowed, in terms, that his report and motion grew out of the proposition for the Congress of London, and that the labors of the commission were, in part, intended as a preparation for that assemblage. The third is an imperial commission for Russia, named by decree of the Czar last spring. The first two of these commissions, namely, for Italy and France, have, for object, penitentiary

reforms in those countries. The third has been created with a view, not of improving an existing prison system, but of devising one entirely new, for a vast and powerful empire. They are all composed of eminent citizens, chosen on account of special fitness for the work to which they have been called. The French commission is formed, in one respect, on the model of the congress; that is to say, it combines the official and non-official elements, which, as M. Lucas has shown, gave a character of special originality to that body. The act created a commission of fifteen members of the Assembly, with authority to associate in their labors such other persons, from outside the legislative body, as they might deem proper to invite. The commission is actually constituted of fifteen members of the Assembly and fifteen private citizens summoned to their aid.

12. The Congress of London has made easy the holding of future congresses of the same kind, since all agree that it has been a success, and all unite in the desire that others, with similar aims and objects, should follow, and, indeed, that a character of periodicity should be given to them. But, more than this, it has taught us how to prepare for and conduct them in such a way as to derive the highest advantage from their labors.

The appreciation of the congress and its labors, contained in the foregoing paragraphs, is shared by many eminent men in Europe, as correspondence, had with them by the undersigned since its sessions were closed, abundantly attests. I venture, in proof of this, to offer a single extract from one of the letters received within the period referred to. It is from Mr. M. S. Pols, one of the official delegates from Holland, who took rank, by common consent, among the most intelligent, industrious, and useful members of the congress. Mr. Pols says:

I received a copy of the London Times containing your letter, and on nearly all points fully concur with you in opinion. I never expected any direct result from the congress, nor do I believe such to be the case with any congress not specially convoked for the solution of a distinctly stated question. The great aim of such congresses is to stir public opinion and to give it a mighty impulse in some direction. This aim, I believe, has been fully attained by the London congress, and as I believe that public opinion rules the world, not only in free countries, like yours and mine, but even in states seemingly directed by an uncontrolled executive power, the indirect results of the congress will soon appear, and our (or, as I do not hesitate to say, your) work will be proven not to have been fruitless. The thoroughly practical and scientific character of the proceedings, the earnest, and on many points exhaustive discussions, and the unanimous accord finally reached concerning so many great and important principles of penitentiary discipline, insure its success, which will prove the greater, as it will be won by instillation and not by strong measures, too soon in general counteracted by reaction. Nor do I think it one of the least remarkable results of the congress that men, so widely diverging as to the means of working out common principles, have met one another without any quarreling or personal strife, but, without an exception that I am aware of, have shown the greatest esteem for their strongest antagonists, the largest toleration for adverse opinions. The absence of petty jealousies and personal vanities insures, as I believe, an impartial and broad consideration of the rival systems.

The report which the undersigned has the honor now to submit to the President will consist of five parts, as follows:

Part First will present a complete *résumé*, arranged in subjects, of the information furnished in the official reports submitted to the congress from the different countries, thus giving, at a glance, a comparative view of the present state of prison discipline and the progress of prison reform in the leading nations of the world.

Part Second will review and condense the proceedings of the congress, giving the gist of the debates and the main currents of opinion and argument developed in them.

Part Third will contain some notice of the papers offered to the congress, with an analysis of a portion of them.

Part Fourth will embody the results of the personal observations and inquiries of the undersigned in relation to the prisons and reformatories of Europe.

Part Fifth will deduce, from all that has gone before, its appropriate lessons, and state them in the form of suggestions and recommendations.

PART FIRST.

STATE OF PRISONS.

CHAPTER I.

PRISON SYSTEMS.

§ 1. Austria has three classes of prisons, those for male and female prisoners being distinct establishments, viz: 1, prisons for persons sentenced to more than one year of imprisonment; 2, prisons for persons sentenced to less than one year; 3, prisons of the district-courts for minor offenses. Of the first class, there are eighteen, with a mean population of 10,490; of the second class there are sixty-two, with an average population of 7,103; of the third, neither the number of prisons nor the population is given.

The proportion of male prisoners to female in prisons of the first class is as five to one, and in prisons of the second class as six to one.

Until quite recently the associated system of imprisonment alone existed in Austria. Since 1867 all new prison constructions have been arranged in such manner that associated imprisonment may be combined with cellular; so that, excepting short imprisonments, which, it is held in Austria, ought to be wholly cellular, every prisoner should, as a rule, spend at least the first eight months of his imprisonment in a cell, and the remainder in association, under conditions of proper classification, and a consequent gradually improved treatment and a gradual preparation for liberty. Several prisons of the first class have been built or are in process of construction upon this plan, in which, nevertheless, it is intended that one-third of the inmates shall undergo their entire punishment in cells, and that the other two-thirds, after eight months of cellular confinement, shall pass into the state of association and enjoy the benefits of a progressive classification. One prison only of the second class has thus far been arranged on this plan.

The considerations which have prompted this change are that collective imprisonment, carried through the whole sentence, has been found by experience incompatible with individual treatment, and consequently obstructive as regards the moral improvement of the prisoner, particularly in the old and ill-constructed country prisons, so that many are made worse instead of better by their imprisonment. On the other hand, the system of absolute isolation has been attended with this disadvantage, that it makes the prisoner weak-willed, especially if the confinement is long continued. It incapacitates him to meet successfully the temptations that beset him on his return to liberty. Difference of culture is also found to give a wide difference of result in the application of the cellular system, and many prove, on trial, wholly unfitted for isolation. On these grounds it has been judged wisest to choose a middle course, and combine the two systems.

In prisons where the associated system is followed there exists a classification of prisoners in the dormitories. Youthful criminals, especially, are kept as much as possible from old and hardened offenders;

and educated prisoners are not, if it can be avoided, placed with the ignorant, the rude, and the base. The opinion is expressed in the report that the same classification should be (whence the inference is plain that it is not) extended to the time and place when and where the prisoners take their exercise. It is further declared that the basis of classification should be age, education, state of mind, former life, degree of guilt, and the crime committed; a principle which, in the opinion of the undersigned, cannot, in regard to most of the particulars named, be applied with any great degree of certainty, and which, because of its arbitrary character, would be of little value if it could.

There are two kinds of sentence in Austria, viz: to simple or strict *imprisonment* for serious offenses, and to simple or strict *detention* for those of a lighter character. The punishment of imprisonment draws after it the obligation to wear the prison garb, to submit to the prison fare, and to perform the allotted work. Political prisoners are absolved from compulsory labor and from the prison dress, which last exemption is also accorded to prisoners sentenced to simple imprisonment.

The punishment of strict detention involves a treatment conformed, in respect of food and labor, to the prison regulations, but the prisoner is excused from wearing the prison dress and the work given him is of a lighter character.

Simple detention is for persons under arrest, and means merely the safe-keeping of the prisoner, who has the right to choose his own occupation and, if he be so disposed, to provide his own food.

A singular adjustment of the relative duration of cellular and associated imprisonments has place in Austria. A recent enactment provides that, after the lapse of three months passed consecutively in isolation, every period of two days so passed shall count as three in the term of his sentence. Another provision of the same act limits cellular imprisonment to three years and forbids the application of that system to prisoners sentenced for life.

The funds for the support of the prisoners come from the state. Here and there, however, there exist small endowments in land or money, the revenues of which are applied to that purpose. In Vienna there is an old arrangement, by which all theaters and public exhibitions must contribute an annual fixed sum, of which half is paid for the relief of the poor and the other half to the prison-funds of the province of Lower Austria. The prisoners are by law obliged to pay the actual cost of their keep out of their own property. That part which goes to the state is set off against the amount received for prison labor. In the year 1869, the sum paid to the state as the product of prison labor amounted to only the fifteenth part of the sum spent on prisons by the government.

The directors and officers of the prisons of the state receive, when incapacitated, the same pensions as its other servants. These pensions are: After more than ten years of service, one-third; twenty years, one-half; thirty years, two-thirds; forty years, the whole of their last salary.

If an officer before serving ten years becomes incapacitated he receives, once for all, a sum of money equal to his last year's salary. If he has become incapacitated by the service, as, for example, if he become insane or blind, he receives a pension of one-quarter or more, according to circumstances, of his last year's salary.

§ 2. The statement in the report submitted on the part of Belgium, in relation to the classification and number of prisons in that kingdom, is not perfectly clear. From its terms there would appear to be but two general classes of penal establishments, or three, including those for

juveniles, viz: 1, central prisons, corresponding to what among us are known as state-prisons; 2, houses of arrest (called provostal when designed for the safe-keeping of military prisoners), which are found near all tribunals of primary jurisdiction and all courts of justice, for the custody of persons awaiting examination or trial, and also for the punishment of prisoners convicted of minor offenses; 3, houses of refuge for juveniles, of both sexes, acquitted as having acted without knowledge, but placed under the care of the government for a certain period, to be educated and trained to industry and virtue.

The cellular system carries by far the larger number of voices in Belgium, and has the high honor of counting, in that number, its ablest and most earnest living defender, M. Stevens, inspector-general of prisons for the kingdom. Of the twenty-six prisons in Belgium, eighteen are conducted on the cellular system, and of the six congregate-prisons four are undergoing alterations to adapt them to the system of separate imprisonment. The report submitted to the congress by the Belgian authorities states that the legislature has given its preference to the cellular system, because it renders repression more efficacious and because the reformation of the convict is thereby better insured. The results claimed for the system in that country will be more fully set forth in Part Second of this report.

The number of prisoners confined in the Belgian prisons is not given; but the two sexes are stated to be represented in the proportion of 88 per cent. of men and 12 per cent. of women.

There are three kinds of sentence pronounced by the tribunals of Belgium, viz, to imprisonment, to reclusion, and to hard labor. Sentences to simple imprisonment are from eight days to five years; sentences to reclusion from five to ten years; to hard labor from ten to twenty years or for life. The report states that the difference in the treatment of prisoners sentenced to hard labor consists in this, that the first are confined in houses of correction, the second in houses of reclusion, and the third in convict-prisons. This statement is by no means clear, and the obscurity is increased by the fact that, in the enumeration of prisons, as given in a previous part of the report, no mention is made of either houses of correction or houses of reclusion.

In the congregate penal prisons the prisoners are divided into three classes. The lowest class comprises those whose antecedents are the most unfavorable and whose conduct is bad. This class bears the name of punishment-division. The middle class comprises prisoners whose antecedents, without being decidedly unfavorable and their conduct absolutely bad, have, nevertheless, need to be subjected to a probation, longer or shorter, before being definitively classed. This class has the name of probation-division. The third is composed of prisoners who, by their antecedents or their good conduct in the penitentiary, have claim to a special distinction. This class bears the name of recompense-division.

These three classes, although subjected to the same *régime* and the same exercises, are nevertheless the objects of special distinctions. In order to be able to recognize the prisoners who belong to each, a distinctive mark in the clothing is adopted for each division. The prisoners of the punishment-division are subjected to the most painful labors, are deprived of the *cantine*, and suffer various privations, especially that of visits from and correspondence with the outside, except in urgent cases, which are left to the judgment of the director. The passage from one division into another is determined by the administrative commission, on the proposal of the director. To this end the records of

conduct and of punishment are consulted. The examination for classification takes place during the first third of each year, unless oftener made necessary by exceptional circumstances resulting from overcrowding in one or other of the sections.

The numbers of the prisoners assigned to each division are inscribed on a roster suspended on the wall.

The first classification is made by the director according to the known antecedents of the convict on his entrance, the circumstances revealed on the occasion of his conviction, and the notes which are forwarded by the courts. The results of this system of classifying are not stated, but there is an implication that they are not particularly remarkable in an opinion expressed to the effect that, "to obtain solid results in a disciplinary and moral point of view, it would be necessary to appropriate special wards to the different classes."

The funds needed for the support of the prisoners are derived from the same source as the funds required for the support of the other departments of the public service. The cost of each day's support is counted in gross, without taking account of the product of the prison labor, which is turned over to the treasury. The value of this labor is not stated.

The pension granted to prison-officers who have become incapacitated, before the proper time for retirement, for a further discharge of their duties, is regulated on the footing of the average salary of their last five years of service. The pension allowed them on retiring is the same as that allowed to all the other functionaries of the government.

§ 3. In Denmark there are two general classes of sentences, viz, to imprisonment and to hard labor. There are three kinds of imprisonment: 1, imprisonment from two days to two years, during which the prisoner, though restrained of liberty, is permitted to procure whatever comforts he can by his own efforts; 2, imprisonment on common prison-fare from two days to six months, during which the prisoner is subjected to the discipline of the prison and restricted to the prescribed prison fare; 3, imprisonment on bread and water from two to thirty days. These punishments are undergone in the same buildings where persons not yet sentenced are detained. Every jurisdiction has its jail, the whole number in the kingdom being ninety-three. They vary greatly in size, that in Copenhagen having accommodations for more than two hundred inmates, while the smaller ones can receive only from four to six. The ordinary number of persons, in the whole country, who are either awaiting trial or sentenced to imprisonment in jail, is about five hundred. These jails are constructed and maintained at the expense of the jurisdiction in which they are situated. By far the greater part are of recent construction; and as none can be built or materially altered without an approval of the plan by the ministry, the same principles of construction are realized with respect to all. The law requires that imprisonment in the jails be cellular, unless positively forbidden by the medical officer. Consequently all the cells in the more recent constructions are for single persons, and contain about 800 cubic feet of space.

Sentences to hard labor are of two kinds, viz, to "labor for ameliorating" and "labor for punishing." Sentences of the first class, from eight months to six years, are undergone in houses of correction. The imprisonment is cellular, but, with deductions from the terms of sentence, expressly on the ground of the isolation of the prisoner increasing in proportion to the length of the sentence. Thus a nominal sentence of eight months is reduced to six, and one of six years to three and a half, this latter being the longest period permitted by the laws of

Denmark for punishment in separate cells. The persons sentenced to this denomination of labor are either, first, those who have committed a slight offense or, at least, a crime not so great as to receive a sentence of more than six years; or, secondly, those who have not been previously convicted; or, thirdly, young criminals, not exceeding twenty-five years. They are, consequently, without exception, persons whose moral regeneration may be hoped for.

Sentences to hard labor of the second class, ranging from two years to life, are undergone in prisons on the Auburn plan, the prisoners being together in the daytime, but separated at night. The prisoners so sentenced are divided into two classes. The first receive sentences of two to six years, being persons of a more advanced age, or who have been punished before. Their crimes are not great, but their moral vigor is broken. They form the fixed stock of the prisons, inveterate thieves, an assemblage of persons wretched and enervate, as well in a moral as in a bodily point of view; ruined by idleness, drink, and debauchery. The second class receive sentences from six years to life. They have the name of "great criminals," but, though the crime committed may be grave, it does not follow that it has necessarily sprung out of a thoroughly corrupted nature; on the contrary, it often stands solitary and has been committed in a momentary passion or under great mental depression.

For criminals sentenced to "hard labor for ameliorating," there is one prison (male) on the cellular system. For those sentenced to "hard labor for punishing," there are three, (two male and one female,) all on the associated plan. However, as there is but one prison for women, it contains prisoners sentenced to "ameliorating" as well as to "punishing labor;" but the former are treated on the cellular, as the latter on the congregate, principle. The four prisons have accommodations for an aggregate of seventeen hundred inmates. The average number is about twelve hundred, and the proportion of women a fraction over 12 per cent.*

While I am writing this report, a letter reaches me from Mr. Bruün, in which he says that his first work, after his return from London, was to draw up, on the request of the ministry, a proposal touching the manner of carrying into effect the punishment in the congregate prisons, based on the resolutions formed by the congress.

§ 4. The prisons of France are comprehended in six classes, to wit: 1, penal colonies; 2, central prisons; 3, departmental prisons; 4, establishments for the correctional education of juvenile delinquents; 5, chambers, or depots of safe-keeping; 6, prisons for the army and navy.

Formerly, persons sentenced to hard labor received their punishment in galleys. There remains but one establishment of this kind at present, the bagnio at Toulon. The galley-prisons have, since 1854, been replaced by transportation to penal colonies. Of these there are three, viz, in Algeria, in Guiana, and in New Caledonia—an island of Oceanica—the latter being the most important and the most hopeful. The colony of New Caledonia was created in 1864. This island offers, by the salubrity of its climate and the fertility of its soil, conditions propitious to transportation. The transportation of women is authorized by the law, in view of marriages to be contracted with the convicts after their provi-

* The official report from Denmark being very brief, I have supplemented the information given in it by recourse to a paper on "Prison-Discipline in Denmark," prepared for the Cincinnati congress by Mr. Bruün, supreme director of prisons in Denmark.—E. C. W.

sional or definitive liberation. The administration selected, from among the female prisoners of every class, those who expressed a desire to profit by these arrangements. These women are placed, to undergo their punishment until their provisional or definitive liberation, in a special establishment at Maroni, under the supervision of the religious ladies of Cherry. The majority of females, however, sentenced to hard labor still undergo their punishment in the central prisons of the continent.

The central prisons of France correspond to the state prisons in the United States. Their legal designation is "prisons of hard labor and correction." They receive three classes of prisoners, viz, women of all ages and men of the age of sixty and upward, persons sentenced to reclusion, and persons sentenced as correctionals to an imprisonment of more than a year.

The departmental prisons are so called, not only because they are devoted to the exclusive service of the departments in which they are placed, but still more from considerations of property and maintenance; they have also the name of houses of arrest, of justice, and of correction. These prisons receive the arrested; the accused; the correctionals sentenced to one year and less; persons sentenced to severer punishments who are awaiting their transfer; police prisoners; persons imprisoned for debts in matters criminal, correctional, of simple police, and of *fisc*; juvenile prisoners, whether arrested, accused, or committed in the way of paternal correction, and civil and military prisoners *en route*. In general, the three houses are but three distinct wards in the same establishment, although, to answer the intention of the law, the house of correction, as being a place of punishment, should be distinct from the other two.

The establishments devoted to the correctional education of juvenile delinquents receive minors of both sexes of sixteen years and under. These will be considered more at length under another head.

The name of chambers for safe-keeping is given to places in which are received prisoners who are being conveyed from point to point in localities where there is no house of arrest, of justice, or of correction. These chambers and depots have the same destination as such houses, and are but places for the temporary confinement of prisoners *en route*.

The military prisons need not be described in this report.

The cellular system is not applied in any central prison. The discipline of these prisons is that of detention in common with the obligation of silence. Some of them, however, have cellular wards, in which may be confined certain classes of prisoners.

Out of four hundred departmental prisons, fifty are constructed on the cellular system; but even in these, or at least a large proportion of them, it is the edifice only which is cellular, the system being in reality that of association by day, while separation is restricted to the night; so that no attempt is made in the report from France to establish a comparison of the results yielded by the two systems. The report declares that the results obtained by the existing system are far from being satisfactory. More than 50 per cent. of the male prisoners and about one-third of the women discharged from the central prisons fall back into crime. The report strenuously advocates the abandonment of the *régime* in common, so far as the arrested, the accused, and persons sentenced to short imprisonments are concerned.

The part contributed by the labor of the prisoners toward the cost of maintenance is placed at 50 per cent. in the central prisons and at 17 per cent. in the departmental prisons, the deficiency being made up from

the public exchequer. Some of the central prisons, however, do much better than this. In one of the female central prisons it has been possible entirely to withdraw the subsidy granted by the state, the earnings of the prisoners being sufficient for the support of the establishment. In another central prison the earnings more than defray the cost, and in several that result is approached more or less nearly. It is hoped from these examples that the administration will at length attain the end which it has always sought in this regard—that of exempting the treasury from the personal expenses of the prisoners who are confined in its great prisons for punishment.

The difference between sentences to simple imprisonment, to reclusion, and to hard labor, which are the three kinds of sentence known in France, is thus explained: Simple imprisonment is a correctional punishment, its duration being for six days at least and five years at most. It is undergone in a departmental prison if its duration falls within a year; if beyond that, in a central prison. Reclusion is a punishment afflictive and infamous. The sentence to it, which is from five to ten years, is always served in a central prison. It implies the loss of civic rights. Hard labor is an afflictive and infamous punishment. A sentence to it for life involves civic degradation and civil death. The sentence which imposes the punishment of hard labor is printed and posted in the central city of the department, in the city where the sentence was pronounced, in the commune where the crime was committed, and in that of the domicile of the convict. Criminals sentenced to hard labor for a limited term are, at the expiration of their sentence and during their whole life, legally under the supervision of the police.

Classification of prisoners has been practised to some extent both in the departmental and central prisons; but, apparently, it has not been such as to lead to solid results. An experiment, however, of great interest, was inaugurated a few years ago in this direction. Wards, to which has been given the name of wards of preservation and amendment, have been established in many central prisons, and appropriated to persons sentenced for a first offense, committed under the influence of a sudden impulse or of some violent momentary passion. This experiment promises the best results. The prisoners placed in these wards have shown themselves sensible to the distinction of which they have been made the object and have exerted themselves to justify it by their good conduct. The cases are extremely rare in which it has been found necessary to put them back into the common ward.

The different agents of the penitentiary administration are subject, as regards their retirement and the pension that may be granted them, to the rules embodied in the law of the 9th of June, 1853, relating to civil pensions. The principle laid down by this law is that every public functionary, paid directly from the funds of the state, has a legal claim to a retiring pension, when he fulfills the required conditions of age and of continuance in the service, that is to say, when he has attained the age of sixty and has accomplished a service of twenty years. It is important to remark that account is made of military services when there are super-added to them twelve years, at least, of civil services. Moreover, a pension can be granted at fifty years of age, and after twenty years of service, to those who have become incapacitated from a longer discharge of official duty by grave infirmities resulting from the exercise of their functions. In short, this same law relieves from every condition of age and continued service, 1, those who may have been disabled from continuing their service, whether as the result of an act of devotion in some public interest, or in exposing their own life to save the life of one

of their fellow-citizens, or as the result of a struggle or combat encountered in the discharge of their duties; 2, those to whom a grave accident, resulting, notoriously, from the exercise of their functions, shall have made it impossible to continue them.

§ 5. The German Empire was represented by a delegate named by the central government, but no report was submitted on behalf of the whole empire. Five states, however—Baden, Bavaria, Prussia, Saxony, and Württemberg—submitted reports each for itself.

(1) There are four classes of prisons in Baden: Houses of correction; central prisons, of which, however, there is but one; district-prisons; and fortresses.

Prisoners sentenced to hard labor are placed in houses of correction; prisoners sentenced to more than six weeks of imprisonment are placed in the central prison, and those sentenced to less than six weeks in district-prisons. The district-prisons are also used for the safe keeping of persons awaiting trial. There is one prison of this kind for each of the fifty-three district-courts of the grand duchy. The report does not state what class of criminals are sentenced to fortresses, but simply that the number of such is small. It further states that the punishment of those thus confined, as well as of the inmates of district prisons, is simply privation of liberty, the prisoners being free as to the choice of food and occupation.

The punishment of prisoners confined in houses of correction and in the central prison is undergone in cells, as is also the imprisonment of persons under arrest. Certain restrictions, however, have place as regards the infliction of imprisonment on the cellular plan. It cannot be extended, contrary to the prisoner's wish, beyond three years; nor can it, if he be between the ages of twelve and eighteen years and if he object, be applied beyond a maximum of six months. Those who object to this kind of imprisonment beyond the terms named above, and those who are pronounced by the medical officers unfit for it, are treated on the plan of association; nevertheless, they are associated only during the hours of labor; and they are, as far as possible, classified for distribution in the work shops according to their personal qualities, and in a manner best suited to promote their moral amendment.

The results of the cellular system have been favorable, and so have those of the congregate system when it has been organized and carried out on right principles.

The number of prisoners confined, January 1, 1871, and which probably represents about the average, was: Houses of correction, 303; central prison of Bruchsal, 441; district-prisons, under sentence, 198—awaiting trial, 227; total, 1,169. Of these, 85 per cent. were men and 15 per cent. women.

The support of the prisons is derived from three sources, viz: 1, payments by prisoners who have property; these amount to very little; 2, the labor of the prisoners; 3, subsidies by the state.

The gains from prison-labor differ materially, according to the duration of the punishment, the kind of prison, and the number in each. The product of the trades carried on in the cellular prison of Bruchsal has sometimes sufficed to pay the whole expense of the establishment, with the exception of the salaries of officers; and for twenty years it has, on the average, paid considerably more than two-thirds of the current expenses of the prison.

To superior officers, on retirement from service, there is granted an annual pension equal to four-fifths of their salary; to the inferior, equal to one-half.

(2) The classification of the prisons of Bavaria is as follows: 1, houses of correction; 2, prisons for adult criminals sentenced for a term exceeding three months and for juvenile delinquents for a term exceeding one month; 3, district-prisons of courts of justice for adult criminals sentenced for less than three months and for juveniles sentenced for less than one month.; 4, police prisons for persons arrested and held for trial.

There are distinct prisons for men and women of the class called houses of correction; in other prisons the two sexes are placed in different parts of the establishment.

For persons convicted of crimes against property—theft, fraud, robbery, obtaining money or goods under false pretenses, extortion, receiving stolen property, &c., and sentenced to a term exceeding three months—special prisons are provided, to which no other prisoners are sent.

Bavaria has four cellular prisons. One of these only is for sentenced prisoners; the other three for persons awaiting trial. All the other prisons of the kingdom are on the congregate plan.

Cellular imprisonment has existed for only a few years in Bavaria, and consequently (the report states) accurate data touching its effect cannot be given. But the system of isolation, it is added, gains adherents daily, because of the evil effects of the collective system as there practised.

The classification of prisoners is not carried to any great extent; yet the governors must keep prisoners of average good conduct apart from those who give little hope of improvement and whose example would exert a hurtful influence on others.

The funds for the support of the prisons are derived from the products of prison-labor, from fines, and from the public chest. The first of these sources yields 16 to 18 per cent. of the cost; the second, 28 to 32 per cent.; and the state pays the balance.

The pension, on retirement, is regulated by the length of service. If retirement becomes necessary within the first ten years, it is seven-tenths of the salary; if within the second ten, eight-tenths; if within the third ten, nine-tenths; and after forty years of service, or after the officer has reached the age of seventy, the pension is the entire salary.

(3) The prisons of Prussia are: 1, prisons exclusively for hard labor, 29; 2, prisons for imprisonment and simple detention, 15; 3, prisons of a mixed character, 11; 4, houses of correction for the punishment of slight offenses, 16; total, 71. They will hold 26,500 prisoners. Forty-seven prisons are provided, to a less or greater extent, with cells for separate imprisonment day and night, the whole number being 3,247.

There is but one prison organized exclusively on the cellular system. There are, altogether, only 2,000 separate cells for isolation at night, a number (the report says) wholly insufficient, but it is increasing daily by new additions.

There is no sensible difference between the two systems as regards reformatory results. The number of relapses has not been diminished by cellular treatment. Yet some remarkable reformations, even of hardened criminals, have been accomplished by cellular imprisonment, concerning which a doubt is expressed whether they could or would have been effected by imprisonment in common. The effect of cellular separation upon prisoners during their incarceration is said to be decidedly favorable, and, in the comparison, superior to that of associated imprisonment.

The punishments awarded by virtue of the penal code are: 1, hard

labor, the severest—inflicted for life or for a time; minimum one year, maximum fifteen—draws after it compulsory labor, without restriction of kind or place, and various civil disabilities; 2, simple imprisonment—maximum five years; no compulsion to work outside of the prison or at occupations not in accord with the capacity of the prisoner and with his previous social position; 3, imprisonment in a fortress—inflicted for life or a time; maximum, in the latter case, fifteen years—is a simple privation of liberty, with supervision over the prisoner's occupation and mode of life; 4, detention for trifling offenses—maximum six weeks—consists in a simple privation of liberty, but may be intensified by compulsory labor, when inflicted for vagrancy, begging, or professional prostitution. The minimum imprisonment under the last three kinds of sentence is one day.

The classification of prisoners in Prussia goes little further than the separation of the younger from the older criminals.

Prison officers rendered incapable of further service receive a pension, whose amount is regulated by the laws regarding the retiring allowances of all other state officers. To gain a right to a pension, ten years must be served: the pension increases with each additional year of service. It can, however, never exceed three-fourths of the salary.

(4) The prisons of Saxony are divided into the following classes: prisons for severe punishment, 2; prisons for less severe punishment, 3; prison in fortress, 1; reformatory prisons, 5; prisons belonging to courts of justice, (number not stated); prisons belonging to police courts, (number not stated.) The average number of criminals for 1871 was: In the first class of prisons, 1,153; in the second class, 1,001; in a fortress, 1; in reformatories, (otherwise called houses of correction,) 684; in the fifth and sixth classes, 1,800; total, 4,639.

For more than twenty years there has been in Saxony a conviction that sentences of imprisonment should be undergone only for the expiation of crime, the protection of society, and to deter the prisoner from the commission of subsequent offenses. The Saxon government has, therefore, two principal objects in its penal system: the satisfaction of justice and the reformation of the prisoner.

Since 1850 the penitentiary of Zuickau has been specially distinguished by a successful application of the principle of reformation by means of individual treatment. The Saxon government was in consequence induced to extend the same system to all its prisons. The government more readily placed confidence in the new method, because it works by no complicated apparatus, complies with existing circumstances, is based upon the principle of individual treatment, and so combines different modes of imprisonment as to gain the best results. Thus, the common modes of imprisonment and treatment are excluded; and, just as a physician prescribes suitable medicine and diet for his patients, so the administration provides fit education, work, and food for its prisoners. The penitentiary of Zuickau gave proofs that this idea was not only theoretically right, but also practicable. The government, therefore, in 1854, resolved that all the Saxon prisons should adopt the new regulations for internal management and the treatment of prisoners. Accordingly, there is in Saxony no penitentiary where either solitary or collective imprisonment is exclusively employed; both modes are used, according to the prisoners' individual wants. Saxony has eleven prisons where, especially during the last ten years, the reforms mentioned above have been carried out.

(5) The prisons of the grand duchy of Würtemberg are: Prisons of reclusion, 4; country prisons, 3; fortress, 1; prison for minors, 1; dis-

trict prisons, (number not stated.) Of the first class, two are exclusively for men, one exclusively for women, and one for prisoners of both sexes. Criminals sentenced to reclusion and hard labor are placed in these establishments. In the second class, sentences for minor offenses are undergone, the maximum of the imprisonment being for four weeks. The district prisons are mainly for persons under arrest, but minor offenders are also punished in them for a term not exceeding four weeks.

The congregate system of imprisonment, with common dormitories, still prevails in Würtemberg, although cells for isolated detention are found in all the prisons, some of which are used for separation at night and others for purposes of discipline. But it has been resolved to make trial of the cellular system, and to that end a special prison has been erected at Heilbronn, which is expected soon to be opened for the reception of prisoners.

The expense of maintaining the prisons, so far as it is not defrayed by the industrial labor and payments of the prisoners, is borne by the state, which, on the average, contributes about 35 per cent. of the total expense of prisons; the remaining 65 per cent. is derived from the income of the prisons themselves, but the prisoners' payments form only a small part of the amount. What comes from the prisoners is mostly the result of their labor.

§ 6. The official report on the prisons of Italy commences with an explanation of the circumstances of the country. The various provinces of the Italian peninsula, divided for centuries into so many different states, at length united under the house of Savoy, brought with them to the union, each its own laws, institutions, and traditions. It is, therefore, not to be wondered at that there should be found in Italy a wide diversity in penal legislation, and, consequently, great variety in the punishments adopted and in the mode of carrying them out. Thus, the law of the Tuscan provinces had abolished capital punishment since 1859; the Neapolitan and Sicilian legislation still inflicted this sentence in *twenty-two* cases; in other provinces of the kingdom capital punishment was decreed in *twenty-seven* cases. Again, the Tuscan provinces had adopted the system of continual isolation; others preferred and were adopting the Auburn system. In some provinces, fetters were in use both for males and females sentenced to a long imprisonment; in others, they were entirely abolished. In some provinces, only those convicts sentenced to the heavier punishments were admitted into the bagnios; in others, these establishments served as prisons also to those sentenced only for a few years; in others, again, they were entirely proscribed. This diversity in the penal codes and the variety in the methods of incarceration could not be at once done away with, but the government is directing its efforts to the reformation and complete unification of its penal legislation.

For detention before trial there are the central or chief prisons of the provinces, the district prisons, and the communal jails, (number not stated.) For penal detention there are: Bagnios, for criminals sentenced to hard labor for life or a limited time, 21; bridewells, for prisoners sentenced to reclusion or public works, 11; prisons for those sentenced to relegation or banishment, 3; houses of correction, for persons sentenced to simple imprisonment, 6; special establishments, (classed under the general name of houses of punishment,) 10; special prisons for women, 5; houses of correction for juvenile convicts, (minors,) 4; establishments for forced detention (reformatories) of idlers, vagabonds, and youths admitted by request of parents for correction, (which also receive

juvenile offenders before trial,) 31 ; agricultural colonies, 2 ; penal establishment for invalids, 1.

The jails and prisons, as varying in their systems of imprisonment, may thus be classified : two on the system of continued isolation ; two on the system partly of continued isolation and partly of association ; five on the Auburn system complete ; two partly on the Auburn system, partly on that of community, and forty-five on the community system.

The question of establishing a hospital for lunatic convicts and a nautical reformatory is now under consideration by the central administration.

The average number of inmates of the jails (places of preliminary detention and minor punishments) for 1871 was 45,082 ; of the penitentiaries, 10,738 ; of the bagnios, 15,148 ; of the prisons for juvenile convicts under age, 573.

The system of continued isolation has been decreed for all detention-prisons. Several jails have been erected on this plan, others are in process of erection, and plans for a still greater number are under study.

In the sense of assigning prisoners to different penal establishments according to their crimes and sentences, a complete system of classification exists. In the detention-prisons, the following classes are, as much as possible, separated from each other : the arrested, (who are at the disposal of the authorities of public safety,) the accused awaiting trial, those sentenced for terms not exceeding a year, those detained in transit or sentenced and awaiting transfer, women, minors, and persons imprisoned for debt. In the bagnios there are recognized four divisions, with separate dormitories for each. They are : those sentenced for military crimes or assaults, those sentenced for theft, those sentenced for highway robbery, and those convicted of atrocious crimes, such as assassination, homicide, &c. Each of these four divisions is subdivided into three categories, distinguished by marks on their dress, according to their terms of sentence.

The funds for the support of the prisons are drawn from the general budget of the state. For the financial results of the prisoners' labor, reference is made to the official statistics, for which examination the undersigned has no time.

The pension to which the directors and officers of the prisons are entitled, after a service of at least twenty-five years, is determined on the same principle as that of every other officer in the civil service of the state. Thus, when retired after twenty-five years of service, they have as many fortieths of their salary, when it does not exceed two thousand Italian livres, and as many sixtieths when it is more than two thousand livres, as their years of service. But without regard to the twenty-five years of service there are cases of pensions granted to all classes of officers, when one becomes incapacitated by a wound caused by some extraordinary act performed in the discharge of his official duties, or by a disease contracted in the public service.

§ 7. A commission of distinguished and able citizens was appointed by the government of the republic of Mexico, which the undersigned had the honor to represent in the Congress of London as well as that of the United States, to draw up a report in answer to the series of questions submitted to that as well as to the other governments, which were invited to take part in the movement. On the subject of the prison system of Mexico, the commission say that in the capital of the republic there are two prisons, one for those who are simply arrested and detained, and the other for adult prisoners who are to be tried or have been already sentenced. Young children sentenced to a term of

imprisonment are placed in an establishment called "*hospicio de los pobres*," (*hospital of the poor*.) For the punishment of criminal children between nine and eighteen years of age, there is a special establishment, where they receive an elementary religious education and learn a trade.

The system of imprisonment is that of association. Its results are stated to have been very sad, the prisoners generally leaving the prisons worse than when they entered. Penitentiaries on the cellular system are in course of erection in several of the states. Only one has, so far, been completed.

As regards the proportion contributed by the labor of the prisoners towards defraying the cost of maintaining the prisons, the commission reports only in relation to the Federal district and Lower California, where it is from 40 to 50 per cent.

§ 8. In the Netherlands four classes of prisons exist: The central prisons, for criminals sentenced to eighteen months and over; detention-prisons, for terms of sentence less than eighteen months; houses of arrest, for sentences of three months and under; and police or cantonal prisons, for sentences not exceeding a month. The three classes last named also receive prisoners under arrest and awaiting trial. In some cases all three are united together, forming a single establishment.

Both systems of imprisonment, cellular and associated, have place in the Netherlands. In no case, however, can cellular separation be extended beyond a period of two years. The two systems are stated in the report to be applied not uniformly in the different prisons established on each plan, but in a manner quite irregular and little harmonious; consequently the results obtained are not such as to permit a fair and reliable comparison. Hence, there exists in the country a great difference of opinion on the question of preference. Still, the cellular system, considered in itself, and apart from the manner of applying it and the limits to be imposed on it, scarcely encounters any adversaries; and, for short imprisonments, public opinion is well-nigh unanimous in its favor.

The classification of prisoners does not seem to receive much attention in the Netherlands. In the central prisons, the more hardened and dangerous, and those sentenced on re-conviction, are separated from the other prisoners. The results are reported as favorable.

The funds for the support of the prisons are a charge upon the annual budget of the state. The part contributed by the labor of the prisoners is quite inconsiderable.

The pensions granted to prison-officers when they become incapacitated for further service are the same as those accorded to all other employés of the state. Beyond this statement no information is given.

The general proportion in which the sexes are represented in the Netherlands prisons is about twenty women to a hundred men; but this proportion varies, especially in the different provinces.

§ 9. There are four classes of prisons in Norway: Prisons established in fortresses, 3; houses of correction, 4; a penitentiary, 1; district-prisons, (corresponding to our common jails,) 56.

The system of imprisonment is that of association in the fortresses and houses of correction, and of separation in the penitentiary, and, to a very considerable extent, also, in the district prisons.

The sentences to the penitentiary range from six months to six years; but these sentences are shortened one-third, because of the system of

imprisonment (cellular) applied there. No comparison of results yielded by the two systems is given.

The average number of prisoners in the fortresses is 217; in the houses of correction, 940; in the penitentiary, 224; in the district prisons, not stated. The proportion of women in the district prisons cannot be accurately ascertained from the statistical returns; but in the penal establishments it is nearly one-fourth.

No classification of the prisoners is carried out in the prisons based on the system of association, but, in distributing the prisoners in the work-rooms and dormitories, care is taken to keep the less corrupted prisoners separate, as far as possible, from the older and more dangerous criminals. In the penitentiary has been introduced a system of progressive classification, based on the zeal and merit of the prisoners, through which some mitigation of their punishment is gradually afforded, by way of allowing the prisoners, to a larger extent than before, to read, write, receive the visits of their relatives, work in the open air, &c.

The pensions allowed to prison-officers on retirement are not regulated by law, but are matter of parliamentary grant in each individual case.

The expenses of the penal institutions are defrayed out of the exchequer, less the proceeds of the prison-labor. These expenses, in 1872, were 203,410 thalers, of which 109,970 thalers were met by the earnings of the prisoners, leaving 93,440 thalers to be supplied by the state. The expenses of the district prisons are paid by the districts in which they are severally situated. Nevertheless the exchequer has to pay for medicines, medical attendance, spiritual assistance, and the necessary clothing of the prisoners; besides which the district receives from the exchequer an allowance of 24 skilling, equal to 11*d.* sterling, a day for every prisoner. The balance to be paid by the district after these various grants cannot, one would think, be very onerous.

§ 10. The report submitted to the congress on the part of Russia was drawn up by Count Sollohub, president of the imperial commission recently appointed to devise a new penitentiary system for the Russian Empire. The count explains, in his introductory remarks, that a detailed description of the system now in operation in Russia is impossible, and, if possible, could not give an exact idea of things, since the penitentiary question in his country is at this moment passing through a transitional phase, a radical reform being proposed and certain experiments having been already commenced. Russia is thus between two systems, one acknowledged to be unsatisfactory and the other but just dawning, with its methods and measures yet undeveloped. From a scientific point of view, such a transitional phase might be interesting, but it could not give precise statements either as to what exists now or what is to exist hereafter. These considerations caused hesitation in respect to the preparation of any report to be handed in to the congress, but it was finally concluded to prepare and submit a report, under the reserve that it is to be regarded, not as the exposition of a system, but rather as a short sketch of the traditions of the country.

The existing laws of Russia relating to the arrested and the sentenced are divided into two parts, the first referring to the imprisoned, the second to the transported. The following is the present classification of prisons: 1. Prisons properly so called, (*ostrogs*), established in all the towns of the empire. Originally they were merely places of safe-keeping, the actual punishment being either bodily inflictions or deportation to the farthest limits of the empire, with a treatment of greater or less

severity. More recently they have been used for punishment in cases where the imprisonment does not exceed a year and four months. 2. Prisons for arrest. This must not be confounded with preliminary arrest, where the detention is merely that of safe custody. It is a true punishment, which is inflicted by justices of the peace for slight offenses and cannot exceed three months. 3. Houses of amendment and labor, established by the Empress Catherine, probably under the influence of Howard, to whom Russia owes her first notions of the humane treatment of prisoners. 4. Prisons for industrial sections or companies. These companies, sentenced to labor on public works, formerly under the jurisdiction of the minister of ways and communications, have lately passed into that of the minister of the interior. Sentences to this class of prisons cannot now exceed four years, though formerly they might be extended to twelve.

The system of associated imprisonment in rooms still exists in Russia, with some exceptions; for example, in the *ostrogs* of the first class there are separate cells.

The result of imprisonment in common by day and night, and also of deportation, has been found lamentable. It has created in Russia, a class of vagrants and worthless characters (*prolétaires*) not in harmony either with the fertility of the soil or the communal constitution of the country. The system individually preferred by the writer of the report is the following: 1, that of civil imprisonment for the accused awaiting trial; 2, that of cellular imprisonment for the convicted undergoing short sentences, with a reduction of two-thirds of the punishment as compared with the duration of collective imprisonment; 3, for houses of correction and convict prisons, that of separation by night in small cells open at the top, arranged in large common dormitories, well ventilated, well lighted, and under constant supervision, with labor in common workshops. The report opposes cellular imprisonment for long periods, on the ground that it must either render the prisoner torpid, or produce in him such a constant feeling of restraint as will necessarily paralyze the play and development of his individual will, sole means of his regeneration.

Classification of the prisoners is rigidly required by the Russian legislation, but the bad condition of many of the prison edifices, and especially the lack of space, restricts it to the separation of the sexes and of persons arrested from those who are undergoing their punishment.

The prisons derive their support mainly from the treasury of the state. The earnings of the prisoners have thus far been inconsiderable, especially when considered in comparison with the vast population and the immense productive power of the empire.

The system of pensions is uniform for all public functionaries. What that system is is not stated.

§ 11. The prisons of Switzerland may be divided into four groups: 1, those of five cantons are administered on a kind of patriarchal system, (whatever that may mean,) by sisters of charity; 2, those of three other cantons are administered on a different system, but leaving much to be desired in the way of improvements; 3, nine cantons have prisons of medium excellence, some of which are advancing toward the first rank; 4, four cantons, Argovie, Bâle ville, Neuchâtel, and Tessin, have penitentiaries of a higher grade of excellence, into which has been introduced, in different degrees and under various modifications, the progressive Crofton system.

The system of congregate imprisonment predominates; but effort is

made to introduce cellular separation, especially at night. There is a general agreement that the system of association is favorable to industrial labor, and not unfavorable to discipline, but that, when extended to the dormitories as well as to the workshops, it is obstructive to the moral education of the prisoners.

Penitentiary training, it is held in Switzerland, imperatively requires cellular separation, at least in the initial stage; and it is on this sole condition that the prisoners can effectively enter into communion with themselves, a process which would be impeded by the contact and influence of some, at least, of their fellow-prisoners.

After the cellular stage, it is considered expedient to allow those prisoners to work together who furnish ground of hope that a moral reformation has been, or may be, accomplished in them. It is under these conditions that associated labor is found in recently-constructed penitentiaries.

The public opinion of Switzerland shows itself more and more favorable to the progressive Crofton penitentiary system, with conditional and revocable liberation. The exclusively cellular system should be reserved (so it is thought) for houses of preliminary detention, and for them it should be the only system in use.

A methodical classification of prisoners exists only in the more recently constructed prisons, which are conducted, as far as circumstances permit, on the general principles of the Crofton system. There are, however, no intermediate prisons in Switzerland, and, consequently, wherever the Crofton system has been introduced, its application is carried out in one and the same establishment. The financial resources of no single canton would permit the realization of such a system, which could be applied only by a union of funds of several cantons directed to that end. Besides which, public opinion, more or less imbued with the old ideas of intimidation and vengeance, is not yet ripe for such a change.

The treasury of each canton covers the deficit resulting from the difference between the total expenditure and the special receipts of its prisons, which receipts are composed of the proceeds of the prisoners' labor and moneys paid by cantons that place their convicts in the penitentiaries of other cantons of the confederation. In several of the cantons, where the prisons are best organized and industrial labor best managed, the industries yield an income approaching, and in one or two instances covering, the current expenses of the establishments, not including, however, the salaries of officers, the cost of repairs, or the *peculium* paid to the prisoners.

Pensions are granted only in exceptional cases to public functionaries, when they become incapacitated for further service. This rule applies to prison-officers, as to all others.

§ 12. There are in Sweden: 1, cellular penitentiary prisons in each province; 2, central prisons on the associated system—some for women, others for men; 3, houses of arrest in certain small towns and districts.

The cellular prisons are used for the accused during the preliminary proceedings, for prisoners sentenced to hard labor for two years and under, for prisoners sentenced only to reclusion, and for those who, not having the means to pay the fines imposed on them, are required to render an equivalent in the form of imprisonment on bread and water. Some prisons on the associated plan are used for persons sentenced to hard labor for life, and others for those sentenced to hard labor for a term exceeding two years.

The results of cellular imprisonment for those awaiting trial and for

sentenced prisoners released at furthest after two years' imprisonment have been favorable. Congregate-prisons, such as they still exist in Sweden, having dormitories in common for forty to one hundred and thirty prisoners each, are regarded, in spite of the strictest supervision, as nurseries of vice and crime. In those associated prisons where a separation takes place at night, and in which the prisoners work in small groups in common workshops by day, the results are found to be favorable. The official report on the prisons of Sweden was drawn up and is signed by Mr. Almquist, director general of prisons for that kingdom, who says: "Of all known penitentiary systems, it appears to me that the most excellent is the Crofton or progressive system, adopted in Ireland, with its special stages, through which the prisoners are required to pass."

No classification of prisoners exists, beyond that of separating the sexes, and, as far as possible, young prisoners from the older and more hardened ones, in the common dormitories of the associated prisons.

Prisoners not yet sentenced and those sentenced simply to reclusion are not compelled to work. They spend their time as they like, working, reading, &c. They may procure better food and more comforts than the prison supplies, provided they do not thereby interfere with the order and security of the prison. Prisoners sentenced to hard labor must do the work set them, and are restricted rigidly to the prison fare.

On attaining the age of fifty five, prison-officers have the right to retire from the service on a pension of two-thirds of their salary; those who serve till they are sixty-five generally receive from the Parliament a pension equal to their whole salary.

§ 13. The North American Republic is composed of nearly forty States with local self-government, and a dozen dependencies not yet elevated to the rank of States. These fifty jurisdictions are, in matters of crime and punishment, independent of each other, and very little controlled by the National Government. They vary in antiquity from Virginia, New York, and Massachusetts, which have been inhabited by the Indo-European races for more than two centuries and a half, to the new Territories of Dakota and Montana, which ten years ago were occupied only by roving savage tribes; and, consequently, almost every variety of social condition prevails in this vast area, larger than half of Europe and more populous at this moment than any European nation except Russia.

As a nation, the United States have existed for nearly a century, their separation from the British Empire being coeval with the first improvement of prisons, resulting from the labors of John Howard. Consequently, the prison system of America, like all the modern systems, dates no further back than 1784, when the old Walnut Street prison of Philadelphia was built, and the first organized effort to improve prison discipline in the United States was made by the Pennsylvania Society for alleviating the Miseries of Public Prisons, of which Dr. Franklin was one of the founders, in 1787. The National Government, as now established by the Federal Constitution of 1787, dates from the same period; but it has never much concerned itself as a Government with the prison system of the country, its first step in that direction being the appointment of the undersigned in 1871, as a commissioner to the International Prison Congress of London. Whatever has been done, therefore, has been the work of the separate States of the Union, and almost wholly within the present century. The oldest penitentiary now in use is probably that of Massachusetts, at Charlestown, near Boston, which was begun in 1800 and first received convicts in 1805. Among the county-jails there are probably a few older than this, but the greater number,

both of state and county prisons, have been built since the beginning of the world-wide controversy between the advocates of the cellular or Pennsylvania system and the silent or Auburn system, now generally known as the *separate* and the *congregate* systems of prison management. This controversy, opened in America about half a century ago, took a concrete and practical form with the opening of the Auburn and Sing-Sing penitentiaries in the State of New York, built on the congregate plan, with separation at night in single cells, and the two penitentiaries of Pennsylvania, at Philadelphia and at Pittsburgh, built on the separate plan, with cellular imprisonment day and night for each convict. New Jersey and Rhode Island, in imitation of the eastern and western penitentiaries of Pennsylvania, introduced the cellular system into their state-prisons, respectively; but those States abandoned the system years ago, and more recently it has been given up at the western penitentiary of Pittsburgh. So the result of the controversy in the United States is that cellularism exists only at the Cherry Hill prison, or eastern penitentiary, in Philadelphia; in some of the county-jails of Pennsylvania; in the Suffolk County jail in Boston; and possibly a few other prisons of the same class. The proportion of prisoners confined on the separate plan in the whole United States is about one to thirty, or in the neighborhood of 3 per cent. It is therefore evident that the system of association, as opposed to that of cellularism, is the one which prevails in the United States. Nevertheless, it is believed that the enlightened friends of prison reform in this country very generally prefer the system of complete separation for all prisons of preliminary detention, and, moreover, that they would prefer the restriction of all detention prisons to the purpose of safe-keeping alone, while minor offenses, they hold, might better receive their punishment in district-prisons, forming a middle class of penitentiaries between the detention-prison and the state-prison, in which reformatory principles and processes might be more hopefully applied than they are now or ever can be in the county-jails.

The broad distinction of American prisons is that stated above, viz, into state-prisons and county-jails. States are the Federal unit of the American republic, and of these there are thirty-seven; but the units of each State are the *counties*, numbering, in the whole country, about 2,100. In each of these counties there is, or may be, a county-prison, and in some of them there are two, three, or four. In the thirty-seven States there are now thirty-nine state-prisons and two state workhouses; the latter in Massachusetts and Rhode Island. In two States, Florida and Delaware, there are as yet no state-prisons; in Pennsylvania and Indiana there are two each, and in New York there are three. Reckoning about forty state-prisons in all, the average number of their inmates, for the last year or two, has been about 16,000; but for the last year the number has been increasing. Of this average number, the State of New York has furnished about 2,700 in its three great prisons; Illinois, 1,300 in its one prison; Ohio, a little more than 1,000; Pennsylvania, a little less than 1,000; Massachusetts, (including the workhouse convicts,) nearly 900; California, almost 800; and Missouri nearly 900; so that these seven States supply about one-half the convicts of the higher grades of crime. The same is true of the inmates of the city, county, and district prisons of all grades, who, in these seven States, average now probably nearly 10,000, out of a total in the whole country of perhaps 22,000. These numbers are nothing more than careful estimates, while the average in the state-prisons is quite exactly computed, the fact being that nobody knows precisely the number of the county-jails in the United States, much less the average of their

inmates; nor is the number of the town and city prisons known, nor the average of their inmates. The district-prisons—intermediate between the state and county prisons—are few in number, and are very well known. These four classes—municipal, (town and city,) county district, and state-prisons—include all places of confinement in the United States, except for juvenile offenders.

In all these prisons, of all classes, when the last census was taken, (June 1, 1870,) the number reported in confinement was 32,208, but this is known to have been too small. The true number, even at that season of the year—the summer—when the fewest persons are in prison, was not less than 35,000, and in the winter of the same year it no doubt rose to more than 40,000, with an average number through the year of at least 38,000. If we suppose the same to be the average number in confinement during 1871, and 16,000 to be the average number of state-prison convicts, (neither being far from the true number,) it is probable that 8,000 of the remaining 22,000, and perhaps even half that number, (which would be 11,000,) are held in jail awaiting trial or sentence, while from 11,000 to 14,000 are under sentence in the minor prisons of counties and districts, for offenses of less criminality than are punished in the state-prisons. As for the sex of these prisoners, if we confine ourselves to general statements, we shall be within bounds in saying that not more than one in six of the 38,000 persons mentioned as the average prison-population of the whole United States are women. The proportion is much less than this in prisons of the highest grades; that is to say, the state-prisons.

§ 14. Prison management has been made a subject of study and discussion in England for more than a century. An interesting and able review of the progress of things in this department of the public service is given by Major Du Cane, chairman of the directors of convict-prisons, in the report which, by direction of the British government, he submitted to the penitentiary congress. It would occupy too much space to give even the most condensed summary of this history, and the undersigned limits himself, therefore, as in the case of other countries, to a brief exposition of the actual penitentiary system of England as applied in the convict or state prisons, and set forth in the paper of Major Du Cane.

The English convict-system is devised with a view to combine the principle of deterrence with that of reformation. While the importance of the latter of these principles is admitted, the former is held to be paramount, because punishment (such is the theory) is designed primarily to prevent crime by the warning thereby held up to those who might, but for such deterrent influence, fall into it.

The sentence to penal servitude in England is divided into three principal stages. The first stage is passed at Pentonville or Millbank, and lasts nine months in all cases. During that period the prisoner passes his whole time, except the periods allotted to prayers and exercise, alone in his cell, working at some employment of an industrial or remunerative character. The second stage is passed in a prison in which he sleeps and has his meals in a separate cell, but works in association under a close supervision. The third period is that during which he is conditionally released from prison, but is kept under the supervision of the police, and made liable for any infraction of the conditions of his release, the consequence of which is that he is to be returned to prison, there to fulfill the whole of the remitted portion of his sentence. A stage intermediate between the second and the conditional release is applied to women, who may be sent to "refuges" for six months before their re-

lease on license. The refuges are establishments managed by private persons who interest themselves in preparing the women for discharge and in procuring suitable situations for them.

Cellular seclusion for long periods has been found in England to have an enfeebling effect upon the prisoner. When the system was first established, the duration of the time of separation was fixed at eighteen months; but such results followed that, after various experiments, the present period of nine months has been fixed upon as the longest to which prisoners can, with advantage, be subjected to this stage of the discipline. A stage of separate imprisonment is held in England to be indispensable to the best effects of convict treatment. It is not only in itself a severe penal discipline, but the mind of the convict is thereby thrown in upon itself; he becomes accessible to lessons of admonition and warning; religious influences act upon him with greater force, and he is put into a condition in which he is likely to feel sorrow for the past and to welcome the words of those who show him how to avoid evil in the time to come.

There are eleven convict-prisons in England, eight of which are exclusively for males, two exclusively for females, and one mixed. The aggregate capacity of these prisons is: males, 8,764; females, 1,239; total, 10,003, exclusive of infirmary and punishment cells. The average except for number of prisoners is 7,833, of whom 1,100 are women.

Two of the convict-prisons, and parts of two others, are on the separate plan, but separate cells are provided for all prisoners at night, invalids of certain classes and some of the women.

In all but two of the convict-prisons—Pentonville and Millbank—the prisoners work in association.

The pensions granted to retiring prison-officers are regulated upon the same general principles as those accorded to other civil officers.

The whole number of borough and county jails in England is one hundred and twenty-two, of which thirty-five belong to the first class and eighty-seven to the second. There is no difference between these two classes of prisons, except that the county-prisons are governed by the county-magistrates, and the borough-prisons by the borough-magistrates. The aggregate capacity of both classes is 27,169. The average period of imprisonment is less than one month. Three-fourths of the prisoners have terms under a month and the remaining one-fourth under six months. Less than one in a thousand have an imprisonment exceeding the last-named period.

As a rule all prisoners are separated at night. In many prisons they work to a certain extent in association, but under such supervision as the governors consider sufficient to prevent communication.

§ 15. The world—that is, the part of it interested in penitentiary questions—may almost be said to know the Irish convict-prison system by heart.*

This system consists of three, or, including the period of provisional liberation, four, stages.

The first stage is that of cellular imprisonment. Its duration varies from eight to nine months, according to the conduct of the prisoner. During this first stage the imprisonment has a character intensely penal. The work required is rude and uninteresting, and the rations furnished are moderate in quantity and coarse in quality. The aim of this rigor is to cause the prisoner to enter, as it were, into himself, and to produce

*This has heretofore been commonly known as the Irish prison system, but is now coming to be designated as the Crofton system, in compliment to the eminent man who devised and first put it in practice.—E. C. W.

upon his soul a lasting impression. The prisoner, however, during this initial stage, is made thoroughly acquainted with the whole system and with all the advantages that will accrue to him in his progress toward liberty, if he takes kindly to it and is uniformly well-behaved and attentive to all his duties.

The second stage is passed in a congregate prison, with separation at night and associated labor during the day. The prisoner is here subjected to a much milder treatment, and his condition is improved more or less rapidly according to his conduct. He receives each month a certain number of marks which determine his advance from one class to another, for the essential principle of this second stage is that of a progressive classification, based on good conduct and merit. There are four classes. Each class marks a change in the prisoner's situation and a mitigation of his punishment. On reaching the fourth class he no longer wears the prison-garb; he is employed on special works; he enjoys many privileges; and he may almost be said to approach the state of liberty. It is this second stage which really characterizes the system. It is so arranged and adjusted as to become an effective trial of the prisoner. If he is steadfast in his good resolutions and good conduct, he passes on from class to class; if, on the contrary, he is ill-disposed and disobedient, he is degraded to an inferior class, even to the lowest, if his conduct be such as to merit such severity. The convict who has successfully passed through this series of trials is adjudged to be prepared for a state of comparative freedom, and he is consequently admitted into the intermediate prison.

This constitutes the third stage in the Crofton system. Here the imprisonment is little more than moral. The prisoner wears the dress of a freeman, works on a large farm with his fellows, attends the village church, and is subjected to little more restraint of any kind than an ordinary free laborer. This is, in effect, a probationary stage, and is designed to test the genuineness of his reformation. It is, for him, so to speak, the apprenticeship and prelude of liberty. If he hold out to the end in a good course of conduct, he receives a ticket of license and becomes conditionally free. The duration of his imprisonment may thus be shortened to the extent of a fourth part. But if, on the other hand, his conduct is evil, he is remanded to the associated, or even to the cellular prison, to work his way up again by the same painful and painstaking process as before.

The fourth stage of the Crofton system is that of conditional or preliminary liberation, which need not be particularly described. It will thus be seen that Sir Walter Crofton has devised a complete system of penal treatment; one which has a beginning, a middle, and an end, and which is, at one and the same time, penal and reformatory.

CHAPTER II.

PRISON ADMINISTRATION.

§ 1. All the prisons of Austria are under the jurisdiction of the ministry of justice, which shares its powers of administration with two other classes of authority—local and intermediate. All matters of minor importance, which are naturally the most numerous, are attended to by the local authorities, and those of a graver character by the intermediate authorities. It is only questions of the highest importance that are submitted to the decision of the ministry of justice. The ministry of

justice, as the central authority over all prisons, is by law empowered to appoint an official, from its own office, as the representative of the minister, and to entrust him with the supervision and guidance of all prisons. But, since 1867, an inspector-general of prisons has been appointed.

The ministry of justice appoints the directors of male prisons, the inspectors of female prisons, the chaplains, the book-keepers, and the financial and medical officers. The subordinate officers are named, in certain prisons, by the local, and in others by the intermediate authorities. The tenure of office is, as with all the servants of the state, without limit, that is, during good behavior.

§ 2. In Belgium, as in Austria, the ministry of justice has all prisons under its jurisdiction. The penitentiary of Louvain has a commission charged with the inspection and supervision of that establishment. There are also commissions charged with the general supervision of the other prisons, and constituting administrative boards, invested with the right of investigating and redressing abuses, of proposing and introducing reforms to the advantage of the service, of granting to the employés leave of absence for five days, and of imposing upon them certain disciplinary punishments. The appointment of the directors and assistant directors is by royal decree. The other functionaries and employés of the prisons are named by the minister of justice. There is no limit to the tenure of office; it belongs to the government to judge whether the functionary ought to be retained or dismissed.

§ 3. No information is given in the report from Denmark concerning the prison-administration of that country, except what is contained in the single brief statement that "a director of prisons has the control of all the prisons." It is to be presumed that there are some limitations to his powers; but what they are, the undersigned is unable to state.

§ 4. The prisons of France, except those of Paris, depend upon a central power, which is represented by the minister of the interior, and, under him, by the director of the administration of prisons.

The central power exercises its control by means of general inspections, made by special functionaries—namely, inspectors-general of prisons. Besides this direct and most important control, there is a local control of the prefects for all the prisons and penitentiary establishments; of the mayors and commissions of supervision for the houses of arrest, of justice, and of correction; and, finally, of the council of supervision for the colonies of correctional education of juvenile delinquents.

The director of the administration of prisons is charged with administering, under the authority of the minister of the interior, the prisons and penitentiary establishments of every class in France. Under him, and as a deliberative consultative board, is found the council of inspectors-general of prisons, which is called upon, in the interval of their tours of inspection, to give advice on the more important questions of the service. The instructions and regulations emanating from the central administration are addressed, through the intervention of the prefects, who represent the executive power in the departments, to the directors of the different establishments. At the head of each central prison is found a director. His action extends to all parts of the service. He is specially charged with conducting the correspondence with the minister of the interior, to whom he addresses his reports on the financial, industrial, and disciplinary condition of the establishment, through the agency of the prefects, except in urgent and extraordinary cases. Directors of the houses of arrest, of justice, and of correction are charged with the administration of those establishments in one or more departments. In the prisons situated at the place of their resi-

dence their action makes itself felt directly, like that of the director of a central prison, on all parts of the service, and in the other prisons indirectly through the agency of the principal keepers, who receive their instructions and are required to address to them frequent reports. An important part of their functions has reference to the economical administration of the prisons, to purchases, to the verification of expenses, to the control of the accounts, cash, and material; in short, to the preparation of the various financial documents which they send to the central administration. The principal keepers are the agents charged with the care and supervision of the houses of arrest, of justice, and of correction.

In the central prisons and other similar establishments the functionaries, employés, and agents, to whichever department of the service they may be attached, are named by the minister of the interior.

As regards the houses of arrest, of justice, and of correction, the functionaries and employés proposed for the administration are named by the minister, and the employés of the other services are named by the prefects, as also the agents of supervision other than the chief keepers. Still, these appointments do not become definitive till they have received the ministerial approval.

By the terms of the law of the 5th August, 1850, relative to the education of juvenile delinquents, every private penitentiary colony is governed by a responsible director, approved by the minister of the interior. The employés placed under the orders of the director must be, in like manner, approved by the prefect.

In the department of the Seine, where the prisons are managed, in many of their relations, under authority of special provisions, the directors are named by the minister of the interior, on presentation by the prefect of police; the other employés are named by the prefect. In effect, it is the prefect of police who, in Paris, administers the penitentiary establishments.

The inspectors-general of prisons and penitentiary establishments are named by the minister of the interior.

The duration of the functions of the different employés composing the *personnel* of the penitentiary service is not limited by any determinate time. The agents who have not been gravely derelict in the exercise of their functions continue in place till they have reached the age at least of sixty and have been in service thirty years.

§ 5. The several states of the German Empire represented in the congress report as follows:

(1) All the prisons of the Grand Duchy of Baden are under the control of the minister of justice and foreign affairs, who exercises over them complete administrative power. There is, however, a council of inspection for all the larger penitentiary establishments. This council decides on the complaints of prisoners and the admissibility of administrative proceedings against the inferior prison officers when such proceedings are beyond the cognizance of the director, confirms the contracts entered into by the administration for the supplies of the prison, and gives the necessary order, if desirable in any case, to substitute collective for solitary imprisonment. The superior officers are appointed by the grand duke, the inferior officers by the minister of justice; their appointment is for life.

(2) All the prisons of Bavaria are under the jurisdiction of the ministry of justice. The direction and inspection of prisons where imprisonment of more than three months is undergone belongs exclusively to this ministry, without the action of any intermediate authorities; the

inspection of the other prisons is by local officers. For the cellular prison at Nürnberg, there exists a special council of inspection, consisting of state officials, judges, district-attorneys, and prison-officials, together with private persons belonging to Nürnberg. The directors and administrators are appointed by the King; the chaplains, doctors, teachers, stewards, and technical instructors by the ministry of justice; the keepers and clerks by the director of each prison. The directors and administrators only are appointed for life, but the other officers also look upon the service as one in which their life is to be spent. As a rule, officials quit the prison service either in the beginning, when their inclinations are against this work, or when it becomes apparent that they have not the necessary capacity, or on their being appointed to higher posts.

(3) In Prussia there is no central authority having control of all the different classes of prisons. The local prisons, designed exclusively for preliminary detention and for punishments of short duration, are under the control of the minister of justice, while the great penitentiary establishments belong to the jurisdiction of the minister of the interior, who decides upon the general principles which are to regulate the economic administration of each prison and the treatment of the prisoners under the relations of discipline, religious and scholastic instruction, labor, clothing, and food. He causes inspections to be regularly made of the several penitentiary establishments by the high functionary attached to his ministry, who is specially charged with the oversight of prisons; and he decides, in the last resort, on all matters of complaint presented to him either by prisoners or by employés.

All other matters appertaining to the control and administration of the prisons are attended to by the administrative authorities of the provinces. To these especially belong the permanent control to be exercised over the employment of the moneys assigned to each establishment; over the details of the economic and industrial administration; over the treatment of the prisoners, whether in point of discipline or in other respects; and over the conduct and fidelity of the employés of the prison. In this view, every establishment is inspected by members of the provincial authorities delegated to that duty, at intervals not exceeding the lapse of some months.

The minister of the interior appoints the directors and superior officers of the prisons; the subaltern officers are appointed by the provincial authorities. The superior officers, after a certain period of trial, are appointed for life. The subalterns are liable to dismissal; yet, after some years of blameless conduct, they also are appointed for life.

(4) There exists in Saxony no one central authority for the administration of the penitentiary system.

The administrative authority rests, except in prisons belonging to courts of justice and police, in the hands of the ministry of the interior. The ministry of justice takes cognizance, by commissioners, of the manner in which the sentence is carried out, and also controls the domestic arrangements. The prisons belonging to courts of justice, in which imprisonment not exceeding four months can be undergone, are superintended by the ministry of justice, which has issued remarkable orders relating to the spiritual care and the industrial occupation of the prisoners. Neither the text nor the purport, however, of these orders is given in the report submitted to the congress.

(5) The economic and correctional administration of all the prisons of Würtemberg is controlled by a central authority, which also exercises supervision over district-prisons for preliminary detention and

minor punishments. The central authority is subordinate to the minister of justice. It is composed of members of the departments of justice, of the interior, and of finance; it has likewise attached to it some skilled ecclesiastical members, a doctor, an architect, and a merchant.

The directors and the chief officers of the administration are appointed by the King, on the nomination of the minister of justice, who first consults the commissioners for prisons. These appointments are generally for life. The subordinate officers are appointed by the commissioners for prisons.

§ 6. The whole of the detention and penitentiary administration of the prisons of Italy, whether as regards the buildings, regulations, officers, discipline, or general supervision, is superintended by one central authority, which forms the general prison board and depends on the ministry of the interior. This board is composed of the director-general, four inspectors, and three departments, one of which is intrusted with the supervision of the directive, sanitary, and religious officers and jailors, another attends to the financial administration; and the third regulates whatever refers to the construction of the buildings and the wants of the prisoners. Besides this, there is an office of statistics, a technical officer of engineers, and a copying-office, each of these having special employés and special work.

All these branches of prison administration are concentrated in the general director, who, in his turn, regulates the service, seconded by the consultative vote of a council of administration and discipline, composed of at least two central inspectors, and the director of that department to which is intrusted the special subject under discussion. Nor does it seem possible otherwise to direct an administration so vast, and one requiring, as an indispensable rule, the most perfect unison in thought and regulation, to carry into effect the principle that "every citizen is equal in the eyes of the law."

The directors and officers of the prisons, whether central or local, are named by royal decree; the keepers and foremen by decree of the minister of the interior, on the proposal of the director-general.

The tenure of office for the higher functionaries is for life; nor can they be removed, except for causes which would render them unfit for the service or unworthy of a place among the officers of the state. The keepers are chosen for six years. As to the foremen, their engagements with the penitentiary administration depend, in each case, on special arrangements.

§ 7. There is no central power in Mexico which controls the penitentiary administration of the whole country. The prisons in each municipality are under the care of a commission. The prisons of each state are subject to inspection by the governor of the state. In Mexico itself, (city and district,) the governor and home secretary have a power of inspection.

§ 8. All the prisons in the Netherlands are under the supreme direction of the minister of justice, and the general inspection of the prisons is made by an inspector, who has his deputy in the bureau of the department of justice. For the inspection of the buildings, an engineer-architect is attached to the same department. The courts and tribunals are also required to cause the prisons to be inspected, from time to time, by members assigned to that duty. The reports of all these inspections are addressed to the minister.

The administration of the several prisons is confided to administrative commissions named in each locality where a prison exists. The members of these commissions are named by the King from among the

notables of the locality, who receive no salary. Whatever appertains to the local administration, to the internal service, to the discipline, and to the execution of the general and special regulations is confided to these commissions or is done through their agency. They are in official relation with the minister, either directly or by the deputy of the royal commissioner (governor) of the province, their immediate superior and their honorary president.

The directors of the central prisons are appointed by the King, the other officers by the minister of justice. There is no defined tenure of office. Incumbents hold their offices until they are displaced, dismissed, or voluntarily retire from the service.

§ 9. The department of justice is supreme in the administration of the prisons of Norway. This department is charged with the immediate administration of the prisons which receive prisoners sentenced to hard labor; while, under it, the administration of the inferior or district prisons is confided to the prefects. The position and general functions of prefects are not stated in the report. Every prison of the higher grade has also its local administration, which makes the necessary arrangements with regard to prison discipline, economy, &c.; always, however, in conformity to the rules laid down by the department of justice, or having its approval and sanction. A director-general of prisons is wanting. The special directors and the chaplains of the several prisons are appointed by the King; the medical and financial officers are named by the department of justice; the teachers receive their appointment from the chaplains, and the other functionaries from the directors. The members of the local managing boards of the district, who generally receive no salary, are named by the King, being taken from among the judicial or administrative officers of the district. The subordinate officers of this class of prisons are appointed by the prefects. Tenure of office is not for a fixed time.

§ 10. The prisons of Russia are divided into two classes, military and civil. The military prisons are under the jurisdiction of the ministers of war and of the navy; the civil prisons are attached to the ministry of the interior. The latter are further placed under the Imperial Society for the Guardianship of Prisons. This society was established in 1819, and has for object the introduction of a more humane treatment of prisoners. In 1830 it was by law invested with fresh powers and prerogatives. A committee, formed by a central committee sitting at St. Petersburg under the presidency of the minister of the interior, is established in the capital of each province, with branches in each chief town of the several districts. These committees are composed, *ex officio*, of the officers of the state and of volunteer and benevolent members, who have a small salary and certain honorable prerogatives. These committees select the governors and direct the economic management of the prisons. A considerable sum is granted for this purpose to the committees, who have the right of referring, in a prescribed manner, to the minister of the interior under his double office of minister and president. This system not only lessens the expenses of administration, but has led to considerable gifts and the formation of a special capital. It must, however, be acknowledged that such a system of administration produces a certain amount of carelessness and irresponsibility in the exercise of power, and that the principle of philanthropic committees and their participation in the management of prisoners require important modification in Russia.

Outside of the control of the committees, there was recently established, when municipal laws were created in Russia, a new mode of de-

tention, named arrest, not to be confounded with preliminary arrest. The punishment of arrest, inflicted by justices of the peace for slight violations of the law, cannot exceed three months. The establishment, maintenance, and administration of these new local prisons are under the control of the municipal institutions of each province.

The appointment of directors and of members of committees is confirmed by imperial decree. The other officers are appointed by the minister of the interior. Their tenure of office is not limited.

§ 11. All the prisons of Sweden are placed under the control and administration of a central independent authority, called the general administration of prisons. Under this general administration, the provincial government has the direct inspection of the cellular prisons established in each province. The general administration derives its authority from the government, to which all reports are made through the medium of the minister of justice.

The directors and officers of all the prisons of the state are named by the general administration of prisons. They are appointed for no specified time, and generally they retain their places as long as they show themselves competent to their work.

§ 12. The Swiss Confederation, composed of twenty-two cantons and embracing twenty-five states, does not, by its own power, exercise any control over the administration of penal justice and of prisons, or over the penitentiary *régime*. Military and political penal justice, so far as it is called upon to punish offenses against the constitution and the federal laws, alone comes within its jurisdiction. Each canton is sovereign. It has its own special penal system and its own places of imprisonment. Its prisons are thus placed under the control of the cantonal executive authority or of the council of state.

The supervision of the prisons belongs more especially to one of the departments of the executive power. In certain cantons the prisons are placed, wholly or partially, under the supervision of the department of police, in others under that of the department of justice or of the interior, according to the stand-point from which the importance of this public service is viewed. In the cantons in which recently-constructed penitentiaries are found, the whole or a part of the supervision is confided to the director of justice, or to a special department, which gives its attention not only to prisons, but also to hospitals, insane-asylums, &c. This department associates with itself a commission of supervision composed of three to seven members, selected from among persons experienced in questions of penitentiary reform, of industry, and of commerce. In the cantons where this machinery exists, an official regulation defines the functions of the commission of supervision. The detention-prisons in the districts and places of detention for civil penalties are supervised by the agents of the council of state—prefects, counselors of prefecture, &c.

The officers and employés of the prisons are named by the council of state. In the cantons where penitentiaries of recent construction exist, the officers are proposed by the department of justice or of police, which takes the advice of the commission of supervision. The foremen and overseers are appointed by the commission of supervision, on the nomination of the director of the penitentiary.

In some cantons the officers are subjected to a re-election every three years, in some every four years, and in others the tenure of office is without limitation.

It may be affirmed that, as a general thing, the officers of the Swiss penitentiaries are not exposed to the influence of political changes, and

that those whose position may have been endangered by the victory of a party have been effectually shielded by a public opinion which appreciated their merits and their devotion.

§ 13. The General Government of the United States, as was observed in the preceding chapter, does not concern itself with prisons. It has not a solitary jail or penitentiary under its jurisdiction, but imprisons the few criminals convicted under its laws and by its own courts in the States where the conviction takes place. Prison-administration, therefore, is a thing relegated to the governments of the several States. But even in the individual States there is no central authority governing all the prisons, although the last ten years have developed a tendency to establish such a central bureau in several of the States. Generally, the bureau is charged with the inspection of prisons only, and has no power to regulate their management or appoint their officers. Such bureaus exist, under the name of boards of public charities, in Pennsylvania, Michigan, Illinois, Wisconsin, and Missouri; and similar boards in Massachusetts, Rhode Island, and North Carolina take some part in prison inspection, or management, or both. In New York the State board of charities is expressly excluded from any direction or even inspection of the prisons, and the three great prisons of that State are placed under the control of another board, known as the inspectors of State prisons, while a private society, with public duties, the New York Prison Association, of which the undersigned was for many years the secretary, is allowed, and indeed required, to inspect all the prisons of the State and the counties. Nothing that can properly be called "*central authority*" over all the prisons of a State is known to exist anywhere in the Union; but wherever there is the nearest approach to this, the results are the most satisfactory. Without it, there is, at best, a great lack of method and of the highest order of prison discipline; and often gross abuses prevail in many of the local prisons. These have been revealed, to some extent, in official reports within the past five years, notably in New York, Pennsylvania, Ohio, Michigan, Illinois, and Wisconsin; and were a searching investigation to be made in other States, even those most noted for the excellence of their prison administration, no doubt such would be revealed in them too. As a rule, each city and county manages its own prisons; and where a city or county has several prisons, these are very likely to be under distinct officers or boards of management, which have little acquaintance with each other and little knowledge of the general system of prisons in the State.

Hence, if we find in any State a prison exceptionally well managed, like the Albany penitentiary, under the management of General Pilsbury, and the Detroit house of correction, under that of Mr. Brockway, it by no means follows that the other prisons will be good; and it may happen that a spirit of envy or jealousy will prevent the managers of one prison from adopting the improved system which has been introduced into another. The chief defects of this disorganized condition of prison management spring, however, from a mutual ignorance of the condition and working of prisons that should co-operate with each other; and one great advantage derived from the meeting of the Cincinnati Prison Reform Congress was a better acquaintance of prison managers with each other, and a wider knowledge gained by them of the prisons of their own and other States.

§ 14. In Great Britain and Ireland the prison system is far from being a unit. In neither country is there any such thing as a central and supreme authority, possessing jurisdiction over all its prisons. For the convict-prisons alone, there is in each a central and controlling

power, which sits at the helm, and which has within its jurisdiction the entire administration of the system. But as regards county and borough prisons, both in the larger and smaller island, the government has little power beyond that of inspection. Each prison has its own board of visiting justices, supreme within its own domain, but with no bond of union between them, and no power capable of giving unity and symmetry to the whole circle and system of prisons and their administration.

CHAPTER III.

PRISON DISCIPLINE.

§ 1. The agencies employed in the prisons of Austria as a stimulus to obedience and industry are: 1. The possibility of imperial clemency. Prisoners cannot shorten their terms of sentence according to any fixed rule, that principle not having, as yet, been introduced into the Austrian penitentiary discipline. But, according to an ancient custom, a number of prisoners who have undergone the greater part of their sentences, and who have given solid proofs of improvement, are recommended periodically to the Emperor for pardon. 2. A share in their earnings. The industrial system is not uniform in the prisons of Austria. In some the labor of the prisoners is let to contractors; in others, it is utilized on account of the state. In the former class of prisons the convicts receive one-half of the proceeds of their work after deducting certain expenses, not very clearly explained in the report. In the latter class they receive a share, regulated by a fixed tariff, which amounts to about the same as that received by prisoners who work on contract. What is said above relates to prisons on the associated plan. In the partially cellular prison of Gratz, each prisoner has his daily task. Here the progressive system has been introduced; according to the measure of his industry and the class to which he belongs, each prisoner has placed to his credit daily a sum varying from two to six kreutzers, and, at the end of the month, the value of whatever overwork he may have done during the month.

Besides the above-mentioned rewards, the privilege is accorded to the prisoners of spending one-half of what stands to their credit (not exceeding, however, a florin and twenty kreutzers a week) in the purchase of additional comforts, as milk, coffee, wheaten bread, cold meats, wine, beer, tobacco, &c.; or they may spend it in support of their families or in buying such clothes as they will need on their discharge. These arrangements, the report states, have worked well.

The most frequent violation of prison-rules are disobedience, rudeness to officers or comrades, refusal to work, and negligence in the performance of the assigned tasks.

The disciplinary punishments employed are: Admonition; coarse and unproductive work; temporary withdrawal of privileges; a bread-and-water diet—not given, however, oftener than on three alternate days in the week; irons, (only used in extreme cases;) hard bed, (either sack-ing or bare boards,) but not more frequently than bread and water; imprisonment in a cell, with employment, and at least two visits a day from an officer, but not exceeding a month, nor to be repeated till a full month shall have passed; removal to another part of the prison; and

confinement in a dark cell, not exceeding three weeks, after which a week must elapse before the prisoner can be returned to it.

An exact record is made of all punishments inflicted, and they are also inserted in a memorandum-book kept by each prisoner.

§ 2. Prisoners cannot shorten their sentences in Belgium by any fixed rule; but this may be done by act of royal clemency in the case of prisoners who are thought to deserve it, on the recommendation of the administrative boards, or boards of prison inspection. They receive a portion of their earnings according to the following tariff: Prisoners sentenced to hard labor receive three-tenths, those sentenced to reclusion four-tenths, and those sentenced correctionally five-tenths. This proportion cannot be increased. Other rewards, accorded to good conduct, to diligence, to zeal and progress in school and labor, and to meritorious actions of whatever kind, are as follows: Admission to places of trust, to domestic service, and to certain exceptional labors; an increase of the privilege of visits and of correspondence; permission to make use of tobacco, in the form of snuff or by smoking it at proper times; the grant of certain diversions and alleviations, such as the gift of books, engravings, tools, useful objects, &c.; propositions of clemency and of reduction of punishment.

The most frequent violations of prison rules are, in the cellular prisons, communications or attempted communications, verbal or written. In the congregate prisons they are infractions of the rule of silence and traffic.

The following are the disciplinary punishments in use: Privation of work, reading, gratuities, the *cantine*, visits, correspondence, and other indulgences granted in pursuance of the regulations; a diet of bread and water; confinement in a special cell, or in a dark cell, with or without the bread-and-water diet; the withdrawal of rewards which might otherwise have been granted.

All disciplinary punishments are recorded in a special register, together with the causes for which they were inflicted. The offenses committed and the punishments administered are also placed in the moral account opened with each prisoner.

§ 3. The report for Denmark states that the discipline is intended to be reformatory. For the cellular prison is established a sort of progressive system. In the associated prisons the inmates occupy separate sleeping-cells. The convicts work in divisions separate from each other. No complete progressive system has as yet been adopted; but such a system is in contemplation. The punishments for breach of discipline are determined by law. Corporal punishments are among them. The most efficacious means of awakening and preserving hope are, in the cellular prisons, the promotion to a higher class; in the associated prisons, wages paid for labor. Conditional release does not take place.

§ 4. The principle of abbreviating the sentences of prisoners, as constituting at once a stimulus and a reward of good conduct, has not yet been introduced into the French penitentiary discipline. This can only be done through the exercise of the pardoning power. Fixed rules are laid down to be followed in applications for clemency, which is generally dispensed in concert with the administrative and judicial authorities, and may therefore be presumed to be done intelligently and on the ground of merit.

In the central prisons the product of the labor is divided into tenths. A portion of these tenths is assigned to the convicts, and takes the name of *peculium*. The quota of tenths granted to the convicts is

determined by the nature of the punishments and the number of convictions incurred. The assignment is adjusted between the three classes thus: Correctionals, five-tenths; reclusionaries, four-tenths; those sentenced to hard labor, three-tenths. The part assigned to prisoners sentenced on relapse is reduced one tenth for each previous conviction, down to the limit of the last tenth, which is, under all circumstances, paid to the convict. The *peculium* is divided by moieties into *peculium* disposable and *peculium* reserved. The first is at the disposition of the convicts during their imprisonment for certain authorized uses, and especially for the purchase of supplementary provisions and supplies, for the relief of their families, and for voluntary restitutions. It also furnishes reserves for fines, punishments, breaking prison, or damages to the prejudice of the state or the contractor. The *peculium* reserved was established in view of securing to liberated prisoners some resources for their first necessities on their discharge from the penitentiary. The number of tenths allowed to convicts may be increased on account of their good conduct and diligence. There may be granted to them, in consideration of these qualities, even six-tenths. Other rewards accorded to convicts are: designation for employment as foreman of a workshop, monitor in the school, overseer of a dormitory, and other positions of trust, such as hospital attendants, store-keepers, secretaries, &c.; also a place on the roll of honor.

The moral offenses most frequently exhibited are theft, assaults, and indecencies. As regards the infractions of disciplinary rules, more than half the cases in the central prisons consist of violations of the law of silence. In most of the penitentiary establishments, next to that just named, the most frequent infractions are refusal to work, the secret use of tobacco, gambling, trafficking, and the unlawful possession of money.

Order and discipline are reported as maintained in all establishments dependent upon the penitentiary administration, without the necessity of a recourse to coercive measures of an excessive severity. Acts of rebellion and violence take place to only a limited extent, thanks to the vigorous enforcement of the rules intended to insure a strict but equitable distribution of disciplinary justice. The punishments, so far as the central prisons are concerned, are: Confinement in a cell, with or without irons; the hall of discipline; dry bread for three days or more; deprivation of the *cantine* or of the ordinary ration; the reduction of the tenths; fines; privation of correspondence and of visits; and sometimes the loss of an honorable position, such as that of foreman, overseer of a dormitory, monitor in the school, &c. The convict who has incurred disciplinary punishments cannot be placed on the roll of honor. Corporal punishments are expressly forbidden.

Every day (Sundays and feast-days excepted) the director of a central prison, assisted by his assessors, holds a tribunal of disciplinary justice, at which are required to appear prisoners reported on the previous evening as having committed some infraction. Each case is fully heard and fairly considered. It belongs to the director to pronounce judgment, and his decisions are immediately inscribed in a register kept for the purpose. Minutes are kept of the proceedings of each session. The punishments adjudged are inscribed by the schoolmaster on the bulletin of the moral statistics of the convict. In the houses of arrest, of justice, and of correction, the punishments are inflicted by the director or the chief keeper, and are inscribed on a special register, which is subject to the inspection of the prefect and the mayor.

§ 5. The German states report: The principle of provisional liberation has been adopted in the penal code of the German Empire.

(1) In Baden actual imprisonment may, by good conduct, be reduced one-fourth, provided, however, that a full year shall have been passed in confinement. The holder of a license may, at any time before the expiration of his sentence, have it revoked for misconduct or an infraction of its terms, in which case the time intervening between his provisional liberation and his re-arrest is wholly disregarded, and the prisoner is required to serve out his entire sentence as if he had not been released at all.

For the performance by the prisoner of the daily task required, which is equal to the average work of a free laborer, the sum of three kreutzers is placed to his credit. For additional work this sum may be increased to six kreutzers. To this reward diligence and the result of efficient work alone contribute, good conduct not being considered. Other rewards are special gratuities, the privilege of spending a part of their *peculium* in procuring increased comforts, better prison fare, such occupation as they like, and school prizes.

The offenses most common are forbidden communications with their fellow-prisoners.

The disciplinary punishments in use are: Reprimands; withdrawal of privileges; solitary confinement, with or without light; privation of bed; diminution of food and drink; and coercive chair, (the prisoner being bound to a solid chair.) A full record is kept of all punishments.

(2) The same rule in regard to the shortening of prison-sentences by good conduct holds in Bavaria as in Baden.

The proportion of their earnings allotted to prisoners varies from two to four kreutzers a day. In this award regard is had to good behavior as well as to industry and capability. Other rewards, given to act as an incentive to good, are: Permission to buy or receive extra articles of consumption; permission to receive more frequent visits and conduct a more extensive correspondence; formal praise or recognition; receiving better and more lucrative work; school prizes, (presents of books;) rewards for work, (presents of money up to four florins.)

The prison regulations oftenest violated are those which arise out of intercourse with other prisoners, namely: Exchange of articles of food and snuff; disobedience and brutality, such as opposition to officials, attacking fellow-prisoners, refusal to work, swearing, noisiness, and quarreling.

The disciplinary punishments are: Reproof; non-payment for labor up to four weeks; reduction of rations for a term of from eight to fourteen days; arrest, with or without work, to a period not exceeding four weeks; imprisonment in a dark cell for a term not exceeding ten days; and wearing of irons, but in such a manner as not to prevent the prisoner from walking. Corporal punishment is strictly forbidden by law.

Every punishment is entered in a book kept for the purpose; an extract from it is added to the documents furnished to each prisoner.

(3) The same regulation in regard to provisional liberation has place in Prussia as in Baden and Bavaria.

Prisoners may receive a part of their earnings, but never more than one-sixth. The exact proportion depends upon their good or bad conduct and the greater or less zeal they have shown at their work. They may dispose of one-half of this share in increasing their prison comforts; the other half is given to them on their release. Beyond the sixth of their earnings no other special rewards are granted to prisoners.

The most common infractions of prison rules in Prussia are: 1. Slight offenses against discipline, as neglecting to keep silence, disorder,

untidiness, and quarreling with fellow-prisoners. These infractions, in 1869, were 57 per cent. of the whole. 2. The violations of regulations are—improper, insolent, and rebellious conduct toward the officers. These were, in 1869, 24 per cent. 3. Those infractions of rules which consist in avoiding and escaping from work. These, in 1869, were 19 per cent.

The disciplinary punishments are: Degradation to the second class of prisoners; privation of the right of disposing of any part of their earnings; privation of the better treatment accorded on holidays; solitary imprisonment in punishment-cells, accompanied by various degrees of rigor; and whipping, only inflicted on men, with a limitation to thirty lashes.

An exact register of all punishments is kept.

(4) Prison discipline in Saxony has a twofold object: the satisfaction of justice and the reformation of the prisoner. Above all things, effort is made to revive and cherish hope in the heart of the criminal, the hope of improving his condition in the prison, the hope of shortening the term of imprisonment, the hope of a complete moral amendment, and the hope of regaining a respectable place in society. The administration thinks that the church, the school, and Sunday's instructions are the best means, in the hands of a sensible officer, for effecting moral reformation. It aims at making the prisoner understand that he can make progress neither in prison nor in civil life without radical and real amendment. The question whether a discipline founded on rewards or punishments is the more successful, is deemed almost superfluous, for it depends much on the individual character of the prisoner. By an order dated March 10, 1864, in consequence of the favorable results of experiments made during the previous ten years, disciplinary punishments were greatly reduced, and now consist in diminution of food, more or less severe imprisonment, and in withdrawing the recompense for work done. Corporal punishment with a rod or thin stick, up to thirty strokes, or punishment on laths, (the former only used against criminals of the lowest class of discipline,) is used under certain restrictions, and can only be applied after mature consideration and deliberation on the part of the officers. It is seldom used, and has, for example, not been applied in the penitentiary of Zwickau for the last ten years. Diligence is rewarded by a higher allowance, and good conduct places the prisoner in a higher class of discipline, or obtains for him a place of trust. A remission of part of the imprisonment is regarded by the prisoners as the highest reward. The administration makes it the termination of the three stages of discipline. The remission of part of the sentence has proved excellent in its results, for down to January 1, 1872, of 415 prisoners dismissed, only 11, or 2.65 per cent., relapsed.

(5) Probationary liberations have been introduced into Würtemberg since the enactment of a penal code for the German Empire. In cases where a question of the full pardon of a prisoner arises, his conduct is especially taken into consideration.

Industrious prisoners receive, for their application and good conduct, a part of their earnings; this part is fixed by the administration at one-fourth; but if their earnings exceed eight kreutzers per day, they can receive only two kreutzers. Prisoners who are distinguished for good conduct are encouraged by being placed in a higher class, by receiving more agreeable and more profitable employment, by being allowed more frequent communication with their friends and more liberty to make purchases out of their earnings, and by being recommended for pardon.

The chief disciplinary punishments are: restricted communication

with their relatives and friends; withdrawal or diminution of the part of their earnings usually granted to them; diminution of food; isolated imprisonment; and imprisonment in a dark cell. In prisons for reclusion, rods are also applied; corporal punishment is excluded. An exact register of punishments is kept.

§ 6. The end aimed at in the administration of penitentiary discipline in Italy is so to direct punishment that, without allowing it to lose its necessary characteristic of deterrence, it shall also possess the other equally essential requisite of reforming the delinquent. Nothing therefore is omitted to obtain this desirable end. While, on the one hand, it is instilled into the mind of the prisoner that he will be enabled, by good conduct, to ameliorate his condition; on the other, the end aimed at is to raise his sense of manly dignity, that he may not become a hypocrite. In the penitentiaries those who distinguish themselves by their good conduct enjoy special advantages, such as being intrusted with domestic work, being recommended to mercy, &c.

In the *bagnios* there has been established a system of progressive classification, under which prisoners, like the mercury in a thermometer, ascend and descend according to their deserts. Each class has its distinctive badge and special privileges. Those prisoners who have distinguished themselves by good conduct in the penitentiaries, and have worked out at least one-half their term, are removed to the agricultural colonies of Pianosa and Gorgona.

The administration is at present occupied in the study of a plan for sending to the island of Capraja (Tuscan Archipelago) those prisoners who have continued in their good conduct during their sojourn in the islands of Pianosa and Gorgona. The prisoners on reaching Capraja will enjoy a semi-liberty within the island, without, however, being quite free from certain disciplinary restraints. This is the Crofton intermediate prison.

The disciplinary system in the two classes of prisons noticed below, varying according to the nature of the sentences to be worked out in them, differs somewhat. In the penitentiaries the punishments in use are: admonitions, privation of food, solitary cells, fetters at the longest for twenty-four hours, solitary confinement from one to six months; while in the *bagnios*, besides admonitions, separate cells, and privation of food, there is also arrest, with or without fetters, the hard seat, &c.

The rewards in the penitentiaries are: the appropriation for the benefit of the prisoner of a quota of the profits arising from his labor; a more generous diet; the privilege of a less interrupted family correspondence; the right of disposing of a portion of the funds accruing from his work; admission into the schools; domestic employment; and recommendation to mercy. The rewards in the *bagnios* are: advancement from a lower to a higher class; elevation to positions of trust and responsibility; exemption from the fetters customarily worn in this class of prisons; and for those alone who have reached the highest class, recommendations to the royal clemency for a full pardon.

It is difficult to decide (so the report declares) which class of disciplinary punishments is most efficacious, the effect depending on many individual circumstances, which cannot be known, much less stated, in advance. Solitary confinement generally reduces to order and quietness even the most obstinate, and this because the individual so punished is withdrawn from the over-excitement produced by the recurrence of the spectacle in which he is both actor and witness. Corporal punishment is forbidden. By the regulations of 1826, flogging was a punishment assigned to a few grave misdemeanors; but this regulation

was modified in 1863, and since then flogging has not been inflicted in a solitary case.

The local director has authority to inflict the minor punishments; for heavier ones it is necessary to have the approval of a special council; the offending prisoner must be heard, and an official report must be drawn up. The more serious cannot be inflicted without notice being previously given to the central direction.

For the protection of the prisoners there exist the following provisions: A visiting commission (especially for the detention jails;) an authorized direct correspondence between the prisoner, the minister of the interior, the director-general, the central inspector, and the magisterial authorities; and a systematic inspection of the prisons by the local authorities and by the central inspectors.

No special discipline, it is held, can be applied to incorrigible convicts; but, as they may be kept in solitary confinement for the space of six months, they become impotent to disturb the discipline of the establishment. The central administration, however, fully recognizing the many benefits which would accrue from such a plan, proposes to set apart a penitentiary, where so stringent a discipline can be exercised as to render superfluous any extraordinary coercive measures, and therein to gather together that class of convicts which, by subtle art oftener than by open rebellion, encourages and prompts discontent among the prisoners, and thus foment a perpetual irritation, so obstructive to the quietness, confidence, and subordination which are the primary elements of a genuine moral rehabilitation.

§ 7. It is provided in the new criminal code of Mexico that offenders sentenced to ordinary imprisonment, or to reclusion, in an establishment of penal repression for two years or more, and who have uniformly behaved well during a period equal to half the time their confinement is to last, have the remaining period of imprisonment remitted conditionally. In this way offenders can not only obtain a diminution of their punishment, but also receive a free pardon, if they have, by their good conduct, shown themselves worthy of it. Any punishment, whether of ordinary imprisonment or of reclusion, in an establishment of penal repression, for two years or more, is to be converted into close confinement, in case the offender should have misbehaved himself during the second or third portion of his time.

All proceeds of the work of the prisoners is given to them if they have been condemned for political offenses or if they are detained for minor offenses against the law; but in the case of those condemned, for misdemeanor or felony, to imprisonment or reclusion, they have 25 per cent. of their earnings, if the punishment lasts more than five years, and 28 per cent., if the time is less. To the above percentages 5 per cent. more is added when a criminal has obtained, by good conduct, his preparatory liberty. Moreover, if he supports himself by his work out of the establishment, another 5 per cent. is added; and this may be increased until the allowance reaches 75 per cent. of the total amount. The advantage of this system is that prisoners are thus encouraged to support themselves by their work, and that they maintain with free persons an intercourse which may be useful, when they recover their liberty, in enabling them to earn their livelihood without returning to a career of crime.

Besides the favors above enumerated, prisoners can, by their good conduct, obtain others. They may enjoy, during the days and hours of rest, any amusement which the rules of the establishment permits. They may apply one-tenth of their reserve-fund to the purchase of any

articles of furniture or comfort which the rules do not prohibit. The kind of work which their sentence condemns them to perform may be commuted into one better suited to their education and habits.

§ 8. No diminution of the sentences awarded by the tribunals can be obtained as matter of legal right by prisoners confined in the jails and penitentiaries of the Netherlands. But, agreeably to a royal decree of 1856, the administrative commissions of the central prisons submit every year a proposition for pardons or remissions, to be granted to prisoners who have distinguished themselves by their good conduct. These propositions, however, include only persons who have been sentenced to more than three years, and who have undergone at least one-half of their punishment, and the remission never exceeds six months. Besides this, all prisoners have the ordinary resource of applying to the King for pardon or remission; and since, in general, a decision is made only after a report from the commission on the conduct of the prisoners, this conduct has, generally, a strong influence upon the decision.

The portion of their earnings allotted to the prisoners are: To civil prisoners sentenced to reclusion and to military prisoners, 40 per cent.; to the inmates of the central prisons, 50 per cent.; and to those confined in other prisons, 70 per cent. These proportions are not increased by reason of the prisoners' good conduct. No other rewards are given to prisoners beyond this participation in their earnings. The distribution of premiums has been abolished for some time, and the industry of the prisoners finds its recompense in the increase of profits, which naturally result from zeal and capacity. Still, the re-establishment of premiums is under consideration at the present moment.

The kinds and frequency of the violations of prison rules differ sensibly in different prisons, and often depend on the more or less intelligent administration of the chiefs and the employés. Insubordination and quarrels may be regarded as the most frequent infractions. Isolation by night (which is not yet generally introduced) has, in this respect, produced good fruits. The disciplinary punishments in use are: Restriction to a diet of bread and water; withdrawal of the privilege of writing and receiving letters; privation of books; the dungeon; fetters; and, in the central prisons, isolation in a cell. All these punishments are recorded in a register.

§ 9. The principle of provisional liberation, and, by consequence, that of the power of shortening the sentence by good conduct, has not been introduced into the criminal jurisprudence of Norway. Only by royal pardon may the duration of a fixed sentence be abridged; but, in deciding on the question of pardon, the behavior of the prisoner during his imprisonment is, as a matter of course, taken into consideration.

Prisoners do not receive any part of the proceeds of their labor. Formerly a certain part was allowed them, but the system was abandoned as not expedient. However, the question of introducing the same system to a greater or less extent, and in an altered manner, has again been raised. In regard to other rewards as a stimulus to self-control and self-exertion, in the houses of correction and the fortresses, an extra allowance of food and other small privileges are accorded to the well-behaved and deserving. For those in use in the penitentiary, reference is made to what has been said in the chapter on prison-systems.

The most frequent infractions of prison rules are: In the cell-prisons, communication with fellow-prisoners; in the other prisons, quarrels, illicit labor, attempts to escape, and laziness. Offenses against discipline are punished with bread and water, confinement in a dark cell, or

with privation of the extra allowance of food; in the prisons exclusive of the penitentiary, corporal punishment is also employed. The punishments are always inserted on the records.

§ 10. In Russia the discipline of the prisons seems to be in a lax and inchoate state. The principle of an abbreviation of sentence by means of good conduct and industry has been admitted only in imprisonment with hard labor, and even there awaits a regular organization and a systematic application. Russian law prescribes work for the prisoners, and grants them a part of their earnings, according to the particular class of prison. But this law still remains almost a dead-letter; it has been executed only in rare cases. The organization of industrial labor is regarded as lying at the root of the penitentiary improvements now under consideration by the government. One of the clauses in the project of reform relates to the proportion of earnings granted to the prisoners. No system of rewards has yet been established.

Drunkenness is reported as the most frequent breach of prison rules, and as having been often encouraged by the cupidity and want of fidelity of the employés.

The disciplinary punishments employed are the dungeon and sometimes castigation or irons. In the better-regulated prisons a record of the punishments is kept.

§ 11. Good conduct produces no abridgment of the time of imprisonment in Sweden. The King exercises the right of pardon almost exclusively in favor of prisoners sentenced to hard labor for life, and whose conduct for ten years has been unexceptionable.

Prisoners are encouraged by being allowed a share in the gain derived from their labor. In the associated prisons the amount received daily varies from one to seven cents of our money. This refers to the generality of prisoners; but those who act as foremen, as well as those who are distinguished for skill, get an additional sum rising sometimes as high as sixty centimes, equal to twelve cents.

In the cellular prisons in the provinces, in which the director procures both work and materials, the earnings of the prisoners sentenced to hard labor are distributed on the following scale: The prisoner receives two-sixths; the director for inspection and furniture two-sixths; the officers who exercise surveillance, one sixth; and, in order to provide help for the prisoner when liberated, the remaining sixth is put in a savings-box. Any prisoner who commits in prison an offense liable to punishment loses his share of the money placed in the savings-box. Of the two-sixths which the prisoner receives he may spend two-thirds in buying additional food, as bread, beer, cheese, lard, &c; but this expenditure must not exceed two francs per week. Those who work in the open air especially require this extra food. There are no other rewards to stimulate the prisoners' zeal.

In cellular prisons the most usual offenses are attempts to communicate with other prisoners, drawing and writing on the walls, and neglect of cleanliness. In the collective prisons the most frequent violations of regulations are insults in words and actions to officers and prisoners, attempts to procure spirits, cheating, and thefts.

In cellular prisons the punishments consist of withdrawal of bed-clothes, diminution of nourishment, or imprisonment in a dark cell for eight hours at most. This punishment is inflicted, on request, by the provincial government. In the associated prisons, besides the punishments just cited, there are added imprisonment, with or without labor, and for very grave offenses the bastinado on men; this last in rare

cases. Imprisonment in a cell for a period exceeding a month can only be by the central authority. An exact record is kept of all punishments.

§ 12. In all the cantons of Switzerland prisoners may, by their good conduct, obtain an abbreviation of their punishment by applying for pardon to the legislative authority, (great council,) which reserves to itself this right. Such reduction is rarely made conformably to fixed rules. In many of the cantons complaint is made that chance and caprice play too conspicuous a part, and that commissions of pardon do not always take account of grave and important facts. In some cantons clemency is exercised readily enough, while in others this is done only in exceptional cases.

In certain cantons a decree of the legislative authority confides to the council of state, or to the department of justice, or even to the police, the right of remitting the latter portion of their punishment (one-twelfth, for example) to convicts whose conduct has been good. In cantons where penitentiary reform has made some progress, there is a tendency to bring down the use of pardons to the minimum, and to substitute the principle of conditional liberation; in short, to confide this function to the direction of the department of prisons, which, having the supervision of the penitentiary administration, is alone capable of judging whether or not the re-entrance of a prisoner into society offers any danger, and whether a probationary liberation may be safely granted him.

In most of the cantons the prisoners have a share in the benefits of their labor. As a general thing this part has rather the character of a gratuity than that of lawful wages. The proportion varies in different prisons, and in the case of prisoners in different classes of the same prison, from 5 to 25 per cent. It is proposed by some of the wisest directors, Mr. Kühne, for example, of the penitentiary of St. Gall, to increase the proportion beyond 25 per cent. to the worthiest of the prisoners. Whatever may be the scale adopted in the different establishments, the gratuity is granted to all the prisoners who, conformably to the regulations, have rendered themselves worthy of it. It is adjusted at the end of every month or every three months, and is placed to their credit in their memorandum of savings.

The other rewards employed to stimulate the good conduct and zeal of the prisoners vary in kind and amount, according to the cantons and the degree, more or less advanced, of penitentiary reform. In well-administered establishments there are granted to good conduct, to application, to zeal, and progress in labor and school the following rewards: In the second penitentiary class, liberty to choose books from the library and to attend the lessons given in class, the use of tobacco—limited, however, to the hours of promenade in the exercise-yard—and liberty to have served to them a supplementary or extraordinary ration of food. In the third or higher class there are added to the above-mentioned rewards the privilege of promenade and free conversation with their fellow-prisoners of the same class, liberty to wear their beard, to work in their free hours for themselves and their families, to adorn their cells and to have plants in them, the use of a patch of land for a garden, and admission to places of trust—such as that of foreman—to superintend their fellow-prisoners in learning trades, or to execute certain exceptional labors in the administrative, industrial, and domestic services.

In the cantons where the old convict-prisons still exist, the most frequent offenses against discipline are disobedience and insubordination; next come escapes or attempts to escape; then lies; and finally immorality in acts and words. In the penitentiaries in which the Auburn

system has been introduced it is found that the infractions most frequent are disorder, want of cleanliness, and violation of the law of silence; in the penitentiaries of recent construction, the want of propriety and dignity, lying, idleness, and disobedience.

The disciplinary punishments in use may be divided into three classes: In the prisons whose organization is imperfect, and where the reformation of the prisoners is not the aim of the imprisonment, we find existing the dungeon and corporal punishments; in penitentiaries on the Auburn system, more or less completely organized, corporal punishments are gradually disappearing, and are replaced by a diet of bread and water and by confinement in the dark or ordinary cell; in the modern establishments there is coming into vogue a new series of punishments, of a moral order, among which figure, by the side of the dungeon and the diet of bread and water, admonition, privation of work, of reading, of visits, of correspondence, and, in general, of all or a part of the diversions, alleviations, and other indulgences above mentioned. Corporal chastisements are passing away, and in their place are substituted the strait-jacket and the cold-douche bath.

Those who, through mischief or negligence, destroy or injure the effects, objects, instruments, and raw material placed at their disposal, are obliged to pay the value of the damage done.

In most of the prisons are found registers in which the punishments inflicted are fully recorded. These registers, in the modern penitentiaries especially, give complete information as to the occasion, the kind, and the nature of the punishments inflicted.

§ 13. There are, perhaps, in the United States a thousand prisons large enough to have the word "discipline" applied to their management; and in these every variety of discipline, lack of discipline, and abuse of discipline are found. In many, little is sought beyond the security of the prisoner and the convenience of the prison-keeper; in many others, the discipline is intended mainly to be deterrent, but through laxity or severity becomes a stimulus to crime; in some, it is really deterrent without being reformatory in aim or result; in a great many, the nominal aim is reformation, but the reasonable means thereto are neglected; in a few, the wise combination of deterrent and reformatory means is attempted, and succeeds in one direction, or in both, according to the skill, opportunity, and perseverance of the prison government. But the great majority of prisons in the United States are, in fact, neither deterrent nor reformatory to any great extent; sometimes because no effort is made to comply with the laws—which almost everywhere require in terms this twofold discipline, though they do not often furnish suitable means—and sometimes because the best agencies are not employed, or are not continued persistently. The deterrent agencies are solitude, silence, hard fare, and constant labor; sometimes also severe punishments are employed. The reformatory agencies are instruction—secular and religious—industrial training, the encouragement of shortened sentences for good conduct, &c. By some of these means "it is sought to plant hope in the breast of the prisoner and keep it there;" and to these are added gratuities for work, the visits of philanthropic persons and of the prisoner's own family, and the promise of help in leading an honest life upon his discharge. Conditional pardon, which enters so largely into the Crofton prison system, has little place in ours, the commutation-laws, by which sentences are shortened for good behavior, being almost the only feature of the Crofton system much in use here, and that not very systematically.

Probably punishments are more relied on than rewards in governing

the prisons; but there is not much variety of either in most of them. Flogging is forbidden by law or usage in most of the States, but is practised in some prisons where it is forbidden. The same is true of the iron yoke, the shower-bath, the iron crown, suspension by the thumbs, and other modes of torture. Deprivation of privileges, solitary imprisonment—often in a dark cell—and wearing a ball and chain, are the most common punishments. Of rewards, the chief is a shortening of the sentence for good behavior; this, in truth, is about all there is that exerts much effect. The other rewards are petty privileges, such as better food, the use of tobacco, a light in the cell, &c. There is no exact mark-system, so far as is known to the undersigned, in any American prison, but there may be examples not yet made public.

§ 14. The principle of conditional release, or the power of abbreviating the term of sentence, is fully introduced into the English convict-prisons. The maximum of abbreviation is one-fourth of that part of the sentence passed in the public works or congregate prison, no account being made of the time spent in cellular separation. This remission is gained by industry alone, which is measured by marks, a certain number of which are accorded daily to the prisoner, according to his diligence. The diligence and zeal of the convict are further stimulated by a system of progressive classification, whereby he may pass through four classes during his term of sentence, viz, a probation, first, second, and third class; and certain selected prisoners are also placed, during the last year of their sentence, in a special class. The minimum stay of the convicts in each of the three lower classes is one year, and the remainder of the sentence may be passed in the first class, unless a prisoner is promoted during his last year into the special class. Every promotion is followed by certain privileges, and each class wears its own badge. Though limited, these privileges offer inducements which are keenly felt. They are, in addition to remission of sentence, more frequent communication by visit or letter with their friends, greater freedom for exercise on Sundays, and increased gratuities to be paid them on their release.

The disciplinary punishments in use are forfeiture of remission, degradation to a lower class, the loss of privileges gained by industry, solitary confinement, reduction of diet, corporal punishment, and so on.

The power of punishing a prisoner resides only in the governor and in the director.

The limits of punishment in both cases are laid down by the secretary of state, and no punishment can be awarded without full investigation of the charge conducted in the presence of the prisoners. The governor has powers sufficient to deal with minor offenses, and every punishment he orders is reported to the director with a statement of the prisoner's offense.

The director, whose functions correspond with those of a magistrate, awards punishments for offenses of a grave character. Only the director has power to award corporal punishment, and he only for certain offenses defined by the secretary of state, and after full inquiry on oath conducted in the most formal manner. No unusual punishments may be inflicted. Chains, handcuffs, or means of special restraint may not be made use of except under certain defined circumstances and under strict regulations, and the use of them is always reported and recorded in a formal manner. No officer is allowed to strike or abuse a prisoner. Should he find it necessary, on account of the violence of any prisoner, to make use of his weapons, he is always called upon to show that he confined

himself strictly to the necessities of the occasion, or, failing to do so, he must bear the consequences.

Every prisoner has the unrestricted right of appeal against the acts of those above him; he may lay his complaint in the first instance before the governor, who is bound to investigate it and to place the appeal on record; or he may appeal to the higher authority of the director, who can, if he sees fit, reverse the decision of the governor.

The director not coming in daily contact with the officers and prisoners, but only visiting the prison magisterially at uncertain intervals, it is of course felt that he can give a fresh and impartial consideration to any question or complaint.

Besides this the prisoners have the power of petitioning the secretary of state. They exercise freely their right of appeal and petition; and the effect of these provisions is not only that prisoners feel that they cannot be unfairly dealt with, but the officers are constantly reminded that they are liable to have to answer for any act which they may perform.

The plan by which it is sought to bring before the prisoner, in a form easily intelligible to him, the fact that, as in ordinary life, the advantages held out to him as an encouragement to industry are directly proportioned to his industry; that he cannot be idle for a day without a corresponding loss; that good conduct is necessary as well as industry, because ill-conduct will deprive him of the advantages he would gain by his industry—is, as has already been remarked, by a system of recording the industry by marks.

To every man is assigned the task of earning a number of marks proportioned to the length of his sentence. These marks may be earned either at the lowest rate, in which case he must serve out the whole of his sentence; or at the highest rate, when he gets about one-fourth of it remitted; or at some intermediate rate, by which he earns a proportionate remission.

The record by marks applies not only to the amount of remission which the prisoner can gain from his sentence, but also to every step of progress made during his imprisonment: for instance, he is required to pass at least a year in each class; but during that time he must earn a definite number of marks, or his promotion is delayed; and, further, the gratuity which he earns in each class is calculated according to the number of marks he earns.

Every prisoner is furnished with a card, on which, periodically, his earnings in marks are recorded; and if he feels himself unfairly dealt with, he has free right to complain, and his grievances are investigated.

In this manner, day by day, week by week, and year by year, he can count and record the progress he is making as regards promotion from class to class as well as in relation to the accumulation of money-credits, and the goal of all his endeavors—conditional liberation. He is thus made to see and feel that he has something to hope and work for beyond the mere avoidance of punishment.

§ 15. In Ireland, discipline is maintained chiefly by moral forces, viz, by rewards in the form of promotions from class to class, increased freedom and privileges—as merited by good conduct—gratuities, remission of part of sentence, &c., and by punishments, taking the shape of degradation from a higher to a lower class, reduction of food, and the like. Whipping is legal, but seldom employed.

All punishments are made matter of record.

The most common offenses are insolence, inattention, and unnecessary talk.

CHAPTER IV.

MORAL AND RELIGIOUS AGENCIES.

§ 1. In the Austrian prisons of all kinds, chaplains and religious teachers are provided for prisoners of every sect, of which the number is considerable. As, however, the greater number are of the Roman Catholic faith, every prison has a Roman Catholic chaplain, and, when the number of prisoners is sufficient to require so many, two or more. Besides holding divine service and administering the sacraments, the chaplains are under obligation to visit the prisoners individually, to seek to awaken the moral sense within them, to strengthen them by spiritual counsel and exhortation on their leaving the prison, and, in general, to labor, in season and out of season and by all suitable means, to reclaim and save them.

The highest importance is attached to the labors of the chaplains, since religious instruction is found the most effective means to acquaint them with the principles of morality and to lift them up from their moral degradation. Many prisoners have lost heart and have fallen into despondency and even despair, from which they find it impossible to raise themselves by their own unaided exertion. As a consequence, they have become callous and indifferent. Religion alone is capable of reconciling them to themselves, to society, and to God. It alone can restore hope to the criminal, the loss of which has been the chief cause of his continuance in a course of crime. Religious influences are, therefore, an essential agency in the moral improvement of prisoners.

Formerly volunteer visitors were excluded from the prisons. The law of April, 1872, permits the visitation of cell-prisons by members of societies which occupy themselves with the care and improvement of discharged prisoners.

There are no Sunday-schools in the Austrian prisons, in the American sense of that institution; but, on Sundays and all church-festival days, lectures are delivered to the prisoners on various subjects of scientific and popular interest.

The frequency with which letters may be written by the inmates of the Austrian prisons is not stated. They write and receive letters by leave of the director, who must in all cases read and countersign them. The correspondence of prisoners with their friends is found to have an excellent effect upon them, keeping up family ties and counteracting the evil influences of prison-life.

Prisoners, with the consent of the director, may, from time to time, receive the visits of their families and friends, provided these latter are of good repute, and otherwise unobjectionable. Visits take place in the conversation-room, except in the case of sick prisoners, and in the presence of an official. They cannot last beyond a half-hour, must be in a language understood by the official present, and must relate to matters approved by him. Their moral effect is generally favorable, as in the case of correspondence.

§ 2. The Belgian government attaches the highest importance to religious instruction as a means of reformation, and has given to it the most complete organization possible. Chaplains are provided in all prisons and for all religions, and the rules require them to preside at the exercises of worship and over all religious instruction, to visit the prisoners in their cells and give them counsel and consolations; to press upon their conscience the diligent performance of all religious and

moral duties, to direct their reading, to hear their confessions, to give special instructions to those ignorant of the essential truths of religion, in a word, to fulfill toward them all the duties of their ministry.

Prisoners sentenced to correctional imprisonment are permitted to write letters every fortnight, those sentenced to reclusion once a month, and those sentenced to hard labor (*travaux forcés*) once every two months. The privilege is granted oftener in urgent cases. The effect is evidently good. It maintains or renews the ties of home and kindred, and aids the officers in the study of the prisoner's character.

Prisoners are allowed to receive the visits of their relatives—father, mother, husband, wife, children, brothers, sisters, uncles, aunts—and guardians, on the production of a certificate granted by the local authority of the places where they reside, authenticating their identity. No other visits are permitted except upon a written order of the superior administration, of the governor of the province, or of the president or one of the members of the commission specially delegated to this effect. In the penal prisons more particularly, these visits take place in the conversation-rooms, in presence of a keeper. This officer observes the persons of the prisoner and the visitor, without interfering with the privacy of the interview. The moral influence of these visits is generally good. The cases are rare (but such have occurred) in which the effect has been unfavorable.

§ 3. In Denmark a clergyman is appointed to each prison. He alone is intrusted with the religious teaching of the prisoners. Volunteer visitors are not permitted to labor in the prisons for the moral improvement of the inmates.

§ 4. In the smaller departmental prisons of France some parish priest acts as chaplain, but in the larger prisons of this class, as well as in all central prisons, the chaplain is a regular officer of the establishment, and is wholly devoted to its religious service. Liberty of conscience is guaranteed to prisoners of all religions. On his entrance, every prisoner must declare to what faith he adheres, which declaration is verified by an administrative information. If he does not belong to the Roman Catholic religion, he is transferred, whenever it is possible, to a prison designed to receive persons of the same religious faith with himself.

In the large penitentiary establishments, the chaplains consult with the directors in determining upon the various religious offices and services. They visit the infirmaries, the sick, the places of punishment, and the solitary cells. In the sessions of the tribunals at the *pretorium* of disciplinary justice, they are entitled to a place among the assessors of the director. To prisoners who are prevented, by their age or infirmities, from taking part in the labors of the evening, they give moral, religious, or instructive readings. They are called upon to give their advice on propositions for the exercise of executive clemency.

No volunteer visitor is admitted into the prisons to labor for the moral regeneration of the prisoners without a special authorization from the minister of the interior; but there exist, for the departmental prisons, commissions of supervision, (*surveillance*), composed of men held in the highest esteem, whose mission is to watch over the entire management, and particularly over everything relating to the reformation of the prisoners. Commissions of this sort have not, hitherto, performed any services in the central prisons.

No Sunday-school, properly so called, exists in the French prisons. Yet, with a view to avert the dangers of protracted idleness, the heads of a number of penitentiary establishments have organized an hour of

school on Sunday, and the administration has generalized this innovation.

In the departmental prisons a special regulation of the administration determines the days and hours on which attention must be given to correspondence. In the central prisons, the prisoner has the privilege of writing once a month to his family. He can correspond only with his nearer relatives or his guardian. The director is charged with the duty of examining the correspondence of the prisoners both ways.

Beyond cases of special authorization, convicts can receive only the visits of father, mother, wife, husband, brother, sister, uncle, aunt, and guardian. During the visit, which does not ordinarily exceed twenty to twenty-five minutes, an officer is always present.

The moral effect of the visits received, as of the correspondence carried on, by the prisoners, is, in general, rather good than bad.

§ 5. The German states reported:

(1) The highest value is attached in Baden to religious instruction in prisons. Chaplains are provided for all prisons and for all religions. They hold religious service, give religious lessons, enter into religious conversation with the prisoners, inspect the prison schools, keep an eye on the prisoners' occupations during their relaxation, and correspond with the ministers of their abode; this correspondence gives moral protection to the prisoners after their liberation. It is their duty to give particular attention to sick prisoners, to those depressed in spirit, or showing any tendency to insanity. They visit the sick weekly, and the other prisoners at least every fortnight. It is their duty at these visits to awaken, so far as possible, moral and religious feeling in the prisoners, and to further their reformation.

No volunteer visitors are admitted into the prisons to labor for the moral benefit of the inmates.

There are no Sunday-schools in the prisons of Baden.

Prisoners have liberty to write to their friends once a month; but correspondence with inspectors, the minister of justice, and the superior courts is unrestricted. Their correspondence has generally a beneficial influence on the prisoners, none being allowed which can in any way interfere with the punishment. All letters sent or received are read by the director or the chaplain.

Visits may be received, of right, monthly, and oftener, as in the case of correspondence, by special leave of the director. They take place in the presence of an officer, the visitor and prisoner remaining separated. Their influence is found to be, in the main, beneficial.

(2) In Bavaria, all the larger prisons have chaplains wholly devoted to the duties of their office; in the district and police prisons, the clergyman of the place officiates. The regular chaplain is bound to hold divine service in the forenoon of every Sunday and holiday and on the King's birthday, and in the afternoon of Sunday to give one hour's reading or exhortation, and to hold a religious service on one week-day; to administer the sacrament to sick prisoners when they demand it, and to those in health once every three months; to give religious instruction twice a week for one hour; to visit the prisoners confined in cells at least every fortnight; to correspond with the clergymen of the places to which the prisoners belong; and to act as librarian.

Volunteer religious workers are not admitted.

There are no Sunday-schools in the prisons, but on that day instruction in drawing is given to the prisoners.

There appear to be no stated periods for writing letters; the only condition would seem to be permission by the director. All letters, going

out or coming in, are examined by the director. Their correspondence has a beneficial effect on the prisoners. If the ties of family have been broken, they are thereby re-knit; if otherwise, they are made stronger.

Prisoners may receive visits at any time by leave of the director. The visits are not to last usually beyond fifteen minutes; they must be in the presence of an officer, and must be carried on audibly, and in a language understood by him. The visitor may neither give nor receive anything from the prisoner.

The influence of these visits upon the prisoners, like that of their correspondence, is found to be useful rather than injurious.

(3) Chaplains are found in all the prisons of Prussia, and for all forms of worship. They hold divine service every Sunday and once during the week; administer the sacrament to the prisoners at stated periods; give religious instruction; superintend the primary instruction given by the schoolmasters; are bound to labor seriously for the salvation of the souls of the prisoners; and, with this aim, must visit them regularly in their cells and in the infirmary.

In all instruction given to adult prisoners, the aim is not so much to impart new knowledge, either useful or necessary, as to teach them to reflect, and to liberate them from that sad brutishness which is so often the chief cause of their crimes. The less instruction is an exercise of mere memory, and the less it demands a mere mechanical activity, the more it engages the attention of the entire man, and the more it acts at once on heart and intellect; and to that extent it the more efficaciously fulfils its highest purpose.

It is held in Prussia that the unchanging truths of religion and morality, when taught in a worthy and striking manner, best fulfil the highest aims of instruction and are richest in satisfactory results. Such instruction in prisons is, therefore, regarded as one of the most important means for the moral reformation of the prisoners.

Private persons who are known to have great interest in all that concerns prisons, and who possess a high moral character, may, at their request, have admission into the prison, with a view to labor for the moral and spiritual well-being of the prisoners.

There are many Sunday-schools in the prisons of Prussia, but neither the manner of conducting them nor their results are stated.

Prisoners must have special permission from the director before they can either write or receive letters; but such permission is withheld only in exceptional cases. All letters are read by the administration. The chaplain generally delivers the letters addressed to the prisoners; he takes this occasion for acquiring a knowledge of their relations and their affairs, and seizes any opportunity he may thus have of inducing them to seek eternal life. Such correspondence with their friends and relatives as is permitted has, in general, a beneficial effect on the prisoners.

Visits to prisoners are only exceptionally allowed, and when the visitor's character is above suspicion. They are made in a room appropriated to the purpose and in the presence of an official charged with listening to the conversation. Their general moral effect is good, and both visits and correspondence are regarded as an efficacious remedy for the despair and wretchedness which so readily take possession of prisoners.

(4) In Saxony, the religious wants of prisoners are equally regarded and cared for, whatever their creed may be. Just as in every truly religious household all the members must mutually help to attain what is desired, so in the Saxon prisons (it is claimed) everything is arranged for the purpose of promoting, above all, moral education by common worship of God and individual care of the soul. But the use of extra-

ordinary moral agencies is not allowed. It is alleged that they have been found unpractical, and that prisoners place little confidence in strangers. Consequently casual visitors are not admitted, even though their purpose be the moral improvement of the prisoners.

(5) In all the prisons of Württemberg there are Protestant and Catholic chaplains. Their duties are to hold divine service on Sundays and festival-days, and to give once a week religious instruction to the prisoners of their respective creeds and general pastoral counsel on all suitable occasions. For prisoners of the Jewish faith there is similar provision for religious instruction. The labors of the chaplains are declared to be most valuable and beneficial in their results.

Permission is not given to volunteer laborers to enter the prisons on missions of benevolence to the prisoners.

Prisoners are allowed, under certain restrictions, to receive visits from their friends and to correspond with them. The regulations and results are much the same as in the other German prisons mentioned in this section.

§ 6. Under the head of *moral and religious agencies*, the supreme director of prisons in Italy, in his report submitted to the congress, holds the following language:

No one will deny that religion has an immense influence over man; but to exercise that influence it is necessary that religion should be sincere and implanted in the heart, and it is in no wise to be confounded with superstition or prejudice. There is no doubt, therefore, that, with those prisoners who have that innate religious sentiment, practical acts of piety and the exhortations of the chaplains have weight; but with the remainder, though it be well that the ministers of religion should do all in their power to implant religious feeling, and though the administration neglects nothing which seems conducive to this end, yet it does not consider *moral* agencies of minor importance, and the greatest of these is the good example to be set before the delinquents by the behavior of the directing officers and jailors.

In some provinces voluntary or semi-official visitors were formerly admitted into the prisons, and the government still allows such; but the administration does not deem it expedient to pass an opinion as to their practical usefulness so long as the commission for penitentiary reform is still deliberating on this important question.

§ 7. All the prisons of Mexico do not have chaplains, nor, when they have such, do they also have them for all denominations. Even where chaplains are appointed, they have no well-defined official duties to perform, except so far as their ecclesiastical functions are concerned, and their duty of course is always to advise and comfort the prisoner and direct him toward reformation. Religion is believed to be the most valuable means of reforming the prisoner. On the days and during the hours allowed by the rules, the doors of the prison are open not only to the members of the protective boards, but also to all persons who, according to the judgment of the council of vigilance, (*junta de vigilancia*), are capable of contributing to the moral improvement of the prisoners. Sunday-schools exist in some prisons, in others not. The favor of writing and receiving letters is generally limited. The results of this correspondence are not very satisfactory.

Formerly prisoners could be visited by all their friends; now only those persons are admitted who have leave of the council of vigilance, when they are believed by the members of that body capable of improving the moral condition of the prisoners by their advice and their example. In that case there is thought to be no necessity to employ any one to listen to the conversations.

§ 8. There are no chaplains, as such, attached exclusively to any of the prisons of the Netherlands; but, in all the central prisons, in all the

houses of detention, and in the greater part of the houses of arrest, the office of chaplain and the religious services are confided to one of the parish ministers of each religion, who is named by the minister of justice. The duties of the chaplain consist in performing religious service on Sundays and feast-days, in making pastoral visits, and in imparting religious instruction. Religious instruction, given with intelligence, is considered of great importance as an agency in the reformation of prisoners. In some prisons there has been introduced the system of proverbs. This consists in hanging on the walls of the corridors and cells pithy moral sentences, and in changing them from time to time. In the opinion of experienced persons, this plan deserves to be recommended for general use.

Persons of both sexes, outside of the administration, are admitted into the prisons to labor among the prisoners, with a view to their moral regeneration. In some cities there are private associations to visit the prisoners, organized by the National Society for the Moral Amelioration of Prisoners.

Sunday-schools have not been established in the prisons of the Netherlands.

The administration of each prison regulates the correspondence of the prisoners as it judges most expedient. There is no general rule upon the subject. All the letters received or written by the prisoners are subjected to the inspection of the directors, and are withheld when their contents are improper. There is, therefore, no ground to apprehend injurious effects, and, in general, the correspondence of the prisoners is attended with a beneficial influence.

The prisoners are permitted to receive the visits of their friends as often, generally, as once a month. A grating separates the prisoner from his visitor, and an employé is always present to supervise the interview, which, as a general thing, may not exceed a quarter of an hour. They cannot converse privately. As in the case of the correspondence, it may be said that the general effect of these visits is good.

§ 9. Every convict-prison in Norway has its chaplain of the Evangelical Lutheran confession, to which faith almost all the people of Norway belong. In the minor district prisons, spiritual assistance is generally afforded by the parish minister of the district where the prison is situated. To the chaplains it belongs to conduct divine service in the prisons and to labor for the reformation of their inmates by the further agencies of personal conversation, admonition, and instruction.

Religious lessons are regarded in Norway as a very effective agent in the reformation of imprisoned criminals.

Sunday-schools exist in most of the convict or hard-labor prisons, but persons outside of the administration are not admitted for moral labor within the prisons.

Correspondence and visits are permitted to the prisoners under due restrictions, and the moral effect in both cases is found to be good.

§ 10. In all the large prisons of Russia there are chapels and chaplains. Prisoners of all the different creeds receive the offices of religion from ministers of their own faith, even Jews and Mussulmans.

The report on the prisons of Russia, as already stated in a previous chapter, was drawn up by Count Sollohub, president of the imperial commission on prison reform for that empire. On the subject of religious instruction in prisons the distinguished count holds this language :

In the present condition of things, the duties of the chaplains rest rather on the performance of religious ceremonies than on the giving of formal instruction. Viewed in its relation to the actual state of things in the country, I find no disadvantages in this

arrangement. Ceremonies speak to the eye and the heart. Religious instruction requires in the priests who undertake it the largest charity and a high civilization. The aggressive principle of the gospel, when disconnected from material interests, is certainly the crown of the servant of God, but this work would require a special clergy trained for the purpose of this particular mission. In addition to the education of those who speak, those who hear must likewise be educated, that they may understand as well as listen. It is impossible to deny the importance of religious worship and instruction, but I think in all things excess is pernicious. A man in more favorable conditions than a prisoner would immediately lose patience if he had to listen only to exhortations to virtue and repentance. The prisoner, having no means of resistance, buries in his heart a hatred which makes repentance impossible, or assumes a hypocritical garb of piety, in the hope of gaining something by it. I think I am not mistaken in affirming that the desire to reform prisoners has often been wanting in an intelligent comprehension of human nature. Virtue is not manufactured by formal methods; such methods can only produce the absence of vice, not the presence of individual morality, which is able to withstand all the assaults of temptation. I have found out by experience that we have many more chances of success when we appeal to men through their interests than through merely their good sentiments, and that, by removing from them the opportunity of doing evil, we naturally lead them to do well, while we fail to turn them from vice by wearying sermons. At the same time I should rigorously insist on attendance at divine service on Sunday, on daily prayers, and on religious instruction in all central prisons. But I think that religious reformation should not be the declared object, but left to develop itself in proportion as hope and confidence re-enter the heart of the criminal, and as he comes to see that his own welfare depends on his reconciliation to society.

It would appear that private persons are, to a certain extent, permitted to visit and seek the moral regeneration of prisoners. On this subject the count says:

There are few persons in Russia who devote themselves to the moral reform of prisoners. Some remarkable exceptions exist; among others, Dr. Hase, who has left behind him a touching celebrity for his efforts in that direction.

There are no Sunday-schools in Russian prisons, such as they exist among us. But in most prisons of any size, discussions on scientific subjects are held on Sunday, in which the prisoners take a lively interest.

As regards the correspondence of prisoners, it is permitted under the necessary limitations; but since the greater part of the prisoners can neither read nor write, the matter becomes of comparatively little consequence.

Visits from relatives are permitted, but with due restrictions. The effect of these visits, in a moral point of view, depends on the morality of the visitors. The reporter adds:

I do not suppose that parents coming to visit their children could injure them. Moreover, I regard that degree of disciplinary punishment which suspends the right of receiving all such visits, without exception, as unjust and unwise, particularly as it often punishes the visitors much more than it does the prisoners.

§ 11. Only Lutheran chaplains are employed in the prisons of Sweden. Few prisoners are found in them of any other religious belief.

The duties of the chaplain are to hold divine service, administer the sacraments, and give religious instruction; to ascertain by conversation the state of the prisoners' minds, and seek their reformation; to take charge of the library and church registers, in which latter he enters observations on each prisoner's manner of life and conduct. If the chaplain is equal to his high mission and zealous in its duties, the faculties of the prisoners are considerably developed; they gain a clear perception of justice; and many of them are led to form a firm resolve to live in future an honest life.

Sunday-schools are found in a few prisons, but they are exceptions to a general rule. Where they exist, they have a beneficial effect.

Persons not connected with the administration can have access to the prisoners only by special permission. Men of high character, and, known to be prudent and capable of laboring for their moral reforma-

tion, are readily permitted to visit them. In the prisons for women well-known ladies have obtained leave to visit the prisoners on Sunday to instruct them, and give them practice in singing.

The privilege of correspondence is pretty freely granted to prisoners, particularly with their nearest relatives, and is found to have a good influence on them.

As regards visits, prisoners awaiting trial, and those sentenced correctionally, have a large license; but those sentenced to hard labor cannot see even their nearest of kin without special permission from the director. Visits are always made in the presence of the director or of an officer detailed to that duty. Duly regulated, they have no bad effect.

§ 12. Ministers of the Reformed and of the Catholic religion act as chaplains in the prisons of Switzerland. The rabbi of the nearest locality is invited to visit such co-religionists as are occasionally found in them.

In the establishments which are imperfectly organized, the chaplains, for the most part, confine themselves to the celebration of public worship. In proportion as the prisons approach the category of penitentiaries that aim at the reformation of the prisoners, these officers are seen paying regular visits to them, consoling and counseling them, superintending the religious instruction of the juvenile delinquents, and fulfilling toward them all the duties of their ministry.

Religious instruction, as a means of reforming prisoners, is looked upon in Switzerland as of the highest importance and as exercising the happiest influence, particularly if the person charged with it possesses the special aptitudes suited to the high mission which he is called to fulfill, and throws aside, as far as he may, mere dogmatic questions. Prisoners in whose heart the religious sentiment is not extinguished at the time of their entrance are easily impressed by the exhortations of the chaplains; on the other hand, such as do not possess it offer to the instructions of religion a soil arid and ungrateful. Among prisoners self-deception and hypocrisy are not unfrequently met with; yet it often happens that individuals who reject or are ignorant of the Bible end by finding in its pages the consolation of which they are in pursuit.

Sunday-schools, properly so called, do not exist in the Swiss prisons. At Zürich the chaplain holds a catechetical exercise in the afternoon, and afterward an instructor gives a lesson in sacred music.

Persons of both sexes, not connected with the administration, are admitted into the prisons to labor for the moral improvement of the prisoners. In the cantons which have new penitentiaries, such persons are authorized to visit the prisoners in virtue of decrees of the legislative authorities. This is especially the case with members of aid societies, who have free access to the prisoners whom they seek to succor.

In the female penitentiaries lady patronesses are frequently met with, especially in the cities which were visited in 1839 by Elizabeth Fry, and where, at the instance of that good and charitable woman, ladies' aid societies were organized to console, to place, to watch over, and to sustain criminal women. At Zürich, where a society of this kind exists, the lady patronesses give to the female prisoners in the penitentiaries regular lessons and take charge of their religious instruction.

The privilege of correspondence with friends is accorded, but under different regulations and with greater or less frequency in different cantons.

In the establishments where the progressive Crofton system has been introduced, prisoners of the middle class can write letters every two

months, those of the higher class every month. But an extension of this favor is often granted, especially in cases where the correspondence is of such a character as to draw closer the ties of family, to exert a good influence, and contribute to the moral cure of the prisoner. This powerful means of moral reformation is more or less neglected in establishments where the organization is imperfect. As the letters pass under the inspection of the director, his eye sometimes detects sentiments which have their taint of hypocrisy; but, in spite of that, the correspondence of the prisoners manifests a strong family affection, and awakens tender household memories.

The visits of relations and intimate acquaintances are permitted the same as correspondence, and are most carefully regulated in the prisons where penitentiary education receives the greatest attention. The internal regulations of different penitentiaries grant the indulgence of visits more or less frequently, but the average is about once a month. As in the case of correspondence, an extension of this privilege is often accorded when the visits are found to have a salutary effect.

§ 13. The American report on this branch of the general subject is exceedingly meager, and appears to the undersigned, with all possible respect to the eminent and noble-hearted author, not quite just to the chaplains of our higher prisons, which alone, for the most part, of American prisons, have an officer of that class. There is scarcely a county jail in the country which enjoys the services of even a nominal chaplain, and it is doubtful whether there is one which has such an officer exclusively devoted to the moral and spiritual welfare of its inmates. Most of the state-prisons have chaplains, but few, it is believed, of the prisons holding a middle ground between the state-prison and the county jail have them. The report represents indifferent chaplains as the rule, good and effective ones as the exception. The undersigned would reverse this order. He has had personal knowledge of many of these gentlemen, and, as a class, he cannot help regarding them as earnest, devoted, hard-working, useful prison officers, and, he is sorry to be compelled to add, very ill-paid for the work they do. It has often been matter of wonder to him that men so competent could be had for a compensation so disproportioned to both the amount and the value of the service rendered. He has known instances in which the services of chaplains have been sought by wealthy churches, at largely increased rates of remuneration, and in which they nevertheless resisted the tempting call and remained in their humbler position of prison pastor, from love to the Master and to those in whom, all fallen and criminal as they are, He has deigned to declare that He is Himself visited and ministered to. However large the prison may be, even though it contain an average population of a thousand or more souls, there is seldom, if ever, more than one chaplain; and he is charged, not only with the spiritual care of this immense multitude, but also with the oversight of the prisoners' correspondence and with that of the library, superadded to all which is not unfrequently the giving, or at least the superintending, of scholastic instruction.

Most of our state-prisons, and some of a lower grade, have Sunday-schools, large and flourishing; not a few have weekly prayer-meetings, which are attended by prisoners varying in number from a score or so to several hundred. Into most of our prisons workers from outside, of known prudence and piety, are freely admitted to labor, in a variety of ways, for the moral and spiritual benefit of the convicts, in most cases (not in all) with excellent effect.

Correspondence and visits of friends are permitted in all prisons, but

under a variety of regulations and restrictions too numerous for statement. The general testimony of wardens and chaplains is that the effect of both is beneficial rather than otherwise.

§ 14. In England, every convict-prison has its staff of ministers of religion, who hold two religious services on Sunday and morning prayers daily, besides performing all the ordinary pastoral duties during the week. For the most part, the chaplains are not permitted to have any other occupations than those appertaining to their office, thus being left free to devote their whole time to the improvement of the prisoners placed under their spiritual care. The advantage of thus inculcating religious truth and seeking to awake religious feeling is held to be incontestible, and notwithstanding the doubts which have been called out by injudicious exaggeration of the results of these influences, the advantages thus afforded are much appreciated by prisoners, and the exertions of the ministers of religion bear perhaps as much fruit as in the world outside.

Volunteer working visitors are not admitted into the convict-prisons.

Periodical letters to respectable acquaintances are allowed, the frequency varying according to the class. The same is true as regards the receiving of visits. Both privileges are found to be beneficial in their influence on the convicts.

All county and borough jails in England are provided with chaplains. Their duties are substantially the same as those of the chaplains of convict-prisons. No Sunday-schools exist in these prisons and no volunteer workers are admitted.

Letters may be written and visits received by prisoners on the expiration of the first three months of their imprisonment; but as a very small proportion of the inmates remain three months, and not one in a thousand six months, it would seem to be, in regard to the mass, but a barren privilege.

§ 15. The regulations and usages of the Irish convict-prisons are substantially the same as those of England in all that relates to the general subject-matter treated of in the present chapter.

No official report was made to the congress in so far as the borough and county prisons of Ireland are concerned.

CHAPTER V.

SCHOLASTIC EDUCATION.

§ 1. The average proportion of prisoners unable to read, in Austria, on their commitment, was, during the years 1868, 1869, and 1870, 38 per cent. of men and 50 per cent. of women.

As a rule, all Austrian prisons are provided with schools. All prisoners of a suitable age to learn, (thirty-five years and under,) and who are either wholly illiterate or of defective attainments, are required to attend the prison school.

The subjects taught are the common primary branches, together with composition, the elements of natural history, physics, geography and history, and, in rare cases, drawing and geometry. Besides this, in all the prisons for men, instruction in vocal and instrumental music is given, but only as a reward of merit and to such prisoners as possess musical gifts. The progress made in the schools is satisfactory.

Libraries have existed in the prisons only during the last few years.

The works selected are, besides those of a religious character, popular works on history, geography, natural history, physics, husbandry, technical subjects, and political economy, books of an entertaining and instructive character, as biographies of celebrated men, accounts of travels, descriptions of customs and manners, and moral tales. The use of the libraries is constantly increasing. Those who are able to read receive books for themselves; for those in associated confinement who are unable to read, readers are appointed. Preference is generally given to tales, travels, and biographical sketches. Only prisoners of some education ask for books of a higher standard. The influence of this reading is exceedingly good, not only because the keeping of order and quietness is thereby greatly assisted, but because the mind of the prisoner is in this way withdrawn from his every-day life, directed to new objects, stirred to higher and better thoughts, and thereby unconsciously ennobled.

§ 2. In Belgium, 49 per cent. of the prisoners when committed are unable to read. Every prison with fifty inmates or more has a school or a teaching lecturer. At the penitentiary of Louvain, attendance is obligatory on all prisoners; at Ghent, it is obligatory on all under thirty years of age, and is permitted to those who have passed that limit. In other prisons, attendance is obligatory on all juvenile delinquents and on all adult prisoners who, having a sentence of at least six months, are under forty; it is permitted to all others. The instruction given in the penitentiary schools includes religion—which is taught by the chaplains or under their immediate direction—morals, reading, writing, arithmetic, elementary notions of grammar, history and geography—particularly the history and geography of Belgium—the elements of geometry and linear drawing in their relations with trades, and other branches of a practical utility. Great progress is made by the prisoners in these studies.

Libraries are found in all the prisons of Belgium. They contain three classes of works, which meet three several wants: that of reforming the prisoners, that of instructing them, and that of diverting their minds by the reading of books at once entertaining, moral, and instructive.

The prisoners are very fond of reading, and spend much time in it. The influence of these readings is found to be excellent, and the formation of prison libraries (it is thought) cannot be made with too much care and discrimination.

§ 3. In Denmark one or two school-masters are appointed to each prison. Prisoners under eighteen, who are only isolated at night, receive a special treatment, with two or three hours' instruction a day. In cellular prisons, convicts under forty receive two to three hours' instruction a week. In the associate prisons, instruction is only given on Sundays. Every prison has school-rooms and a library.

§ 4. The average proportion of adult prisoners unable to read in the French prisons on their committal is 56 per cent.; of juvenile prisoners 81 per cent. are found wholly illiterate.

The organization of primary instruction in the prisons of France dates back to 1819. In virtue of a decree of December 26 of that year, primary instruction, embracing reading and the first elements of calculation, was required to be given to prisoners, following, as far as their number permitted, the method of mutual instruction. Since that time the administration has established schools in all the important prisons. In 1866, the minister of the interior ordered that a greater extension be given to primary instruction, and required that almost the entire prison-

population should be made to share in it, with the exception of old men, invalids, and those whose perversity requires their exclusion. The instruction given in the prison schools comprises reading, writing, the first four rules of arithmetic, and the legal system of weights and measures. To this list of branches may be added mental calculation, surveying, linear drawing, and general notions on the geography and history of France. The administration has not been able, thus far, to allow all the prisoners to participate in the benefits of primary instruction. While striving to give a stronger impulse to instruction, it has been obliged to discriminate, in admitting prisoners to the school, by receiving first the youngest, afterward adults, and among the latter those whose conduct is the most satisfactory.

The progress made by the prisoners is generally rather slow, owing to the little aptitude of the greater part of them. Many who entered wholly illiterate leave the prison knowing how to read, to write passably well, and to perform the simpler operations of arithmetic; but a complete elementary education is rare. The administration has not been as well satisfied as it could have wished with the results of the instruction given in the prisons; and it is at this moment engaged in seeking new methods of instruction and a better organization of the schools in the penitentiary establishments.

The prison libraries include works for Catholics, Protestants, and Israelites, which are intended to serve for their moral and religious instruction; also, books of history, accounts of voyages, literary works, treatises on ordinary and technical science, novels, and miscellaneous works. These books are examined with care by the council of general inspection of the prisons. The works of piety admitted by each religion are designated only on the recommendation of the ministers of the different religions. The catalogue contains special indication of the books more particularly adapted to men, to women, and to children. At this moment the superior administration is engaged in re-organizing and enlarging libraries in all the penitentiary establishments.

The prisoners are generally fond of reading. Those who have a knowledge of this art nearly always profit from the practice of it. They have their Sundays for reading, and on week-days they read during the hours of rest and at meals. In some establishments there are readings in common to convicts who are unoccupied and to others during the intervals of labor. Sometimes such readings are given during meal-time in the refectory. The prisoners listen to them with interest, but those who know how prefer to read to themselves. The distribution of books takes place under the superintendence of the instructor or the chaplain, who, in his selection, has regard to the antecedents, the aptitudes, and the conduct of each prisoner; and the officers charged with this duty perform it in such manner as to cultivate a taste for reading by all the means which are consistent with the exigencies of the service. Books specially written for prisoners are not those which they prefer. They read with greater pleasure books of history, voyages, novels, and narratives which have touches of the marvelous, of elevated sentiment, and of renowned actions.

Reading is found to exert a happy moral influence upon the prisoners. Those who contract a taste for it during their imprisonment are generally well behaved. Properly directed, reading effects a salutary revolution in the soul and imagination of the prisoner. Hence, the choice of books becomes a matter of great importance. Works which amuse by the interest of the narrative and the charm of the style, and those which have in them an element of instruction, contribute to enlighten

and to inform the prisoner at the same time that they afford to him diversion and consolation. They serve to awaken in him the love of home, and sometimes predispose him to the duties of religion.

§ 5. The German states report as follows:

(1) In Baden only 4 per cent. of the prisoners are unable to read when received. Schools are organized in all the prisons. Male prisoners under thirty-five are required to attend, women till they are thirty; beyond the ages named, those attend who choose. The subjects of instruction are the same as those in good primary schools. With few exceptions, the prisoners make satisfactory progress. Every prison has a good library. The books in it are religious, instructive, and amusing. The prisoners for the most part are fond of reading. Books written expressly for prisoners are in little request. Educated prisoners prefer descriptions of voyages, biographies, and technical books; those less educated prefer tales. Suitable reading exercises a beneficial influence; it instructs and relaxes the prisoners' minds, and thus aids their reformation; it favors discipline by removing the feeling of *ennui* and the tendency to disorder.

(2) In Bavaria 12 per cent. of the prisoners on commitment are illiterate. Schools are established only in houses of correction and the general prisons. Attendance is obligatory till thirty-six; after that, it is optional; but prisoners under thirty-six who are already sufficiently educated are excused, if they desire it.

School instruction comprises reading, writing, arithmetic, geography, and German; choral singing and drawing are also taught—the two latter subjects being optional. Prisoners who attend school for less than four months make no great progress; those who have a longer term make very considerable advance.

The libraries consist principally of treatises of a religious and moral character, of books which are generally useful, of popularly-written works on natural and general history, and of popular editions of German classics.

Almost all prisoners in cells read a great deal and enjoy it, but those undergoing collective imprisonment prefer conversation. Reading exercises a good influence by doing away, in great measure, with the evil consequences arising from idleness, and promotes the prisoner's improvement by the cultivation of his mind. Simple tales and entertaining books are preferred—religious books least of all.

(3) Of one hundred prisoners sentenced to hard labor in Prussia, seventeen cannot read when they enter the prison. In other prisons a less percentage are illiterate. Schools exist in all Prussian prisons except four small houses of arrest.

All prisoners undergoing cellular imprisonment receive instruction. Among the associated prisoners preference is given to the young and to those whose education has been greatly neglected, and whose intellectual faculties give promise of subsequent progress.

The prescribed subjects of instruction are sacred history, reading, writing, arithmetic, singing, and sometimes drawing. The lessons in reading at the same time give instruction in the history and geography of Prussia. The arithmetic is such as is useful in daily life. The prisoners are diligent in learning, and make satisfactory progress.

The prisons have libraries containing religious, instructive, and entertaining books. In 1869 the total number of books in these libraries was 144,418: 42,210 entertaining and instructive, 23,745 educational books; the remainder were religious works.

Most of the prisoners are willing and diligent readers. They all show

a marked preference for histories and works on natural science written in a popular style. Such reading has evidently a very good influence on them.

(4) The prisoners in Saxony are generally sufficiently instructed in the elementary branches, but not many of them have gone much beyond that degree of education. The penitentiary takes especial care to supply the defect of the elementary education by obligatory weekly instruction. The general and special preparation for their calling is supplied to the prisoners by free instruction on Sundays. Such instruction is not obligatory, but the prisoner has a claim to it arising from good behavior. It is voluntarily given by the officers, and not by the clergymen and teachers alone. The library in the penitentiary of Zwickau contains 5,000 volumes of religious, instructive, and entertaining books, thus providing for all the mental wants of the prisoners who, under the careful assistance of the teachers, are diligent readers.

(5) Prisoners unable to read and write on their admission to the prisons of Würtemberg form a rare exception. Out of 1,317 prisoners present June 30, 1871, nine could neither read nor write; eight could read and not write. All the prisons have schools. The prisoners must attend school till thirty years of age; prisoners above that age are allowed to attend. The prison schools are as efficient as good primary schools. The branches of instruction are reading, writing, arithmetic, moral and sacred history, geography, history of the kingdom, and, in some prisons, drawing. Those sentenced to short imprisonments have their former knowledge recalled and fixed more firmly in their minds; those suffering long imprisonment have it extended, and thus get a higher education. Attentive and diligent prisoners are much pleased to take part in the instruction. In all the prisons there are libraries. The books are religious, instructive, or entertaining.

§ 6. Both scholastic and industrial education is regarded by the penitentiary administration in Italy as a principal agent for the reformation of prisoners. To judge of the breadth and efficiency of the former, it will suffice to compare the degree of instruction possessed by those who enter and those who leave the penitentiaries. The illiterate among those entering are: In the bagnios, 92 per cent.; in the penal establishments, 64 per cent.; and in the establishments for minors, 60 per cent. These percentages are reduced for those leaving the prisons to: In the first class named, 73; in the second, 46; and, in the last, 12 for the houses of custody and 3 for the reformatories.

In each penitentiary there exists a school, to which is admitted the largest possible number of prisoners, the youngest and best conducted having the preference. In the houses of detention and the reformatories, the school takes a wide range, as it admits all the inmates indiscriminately, and in these are specially taught drawing, vocal, and instrumental music, agriculture, some foreign language, &c., and this with admirable results. Every prison, whether for juveniles or adults, has a small library belonging to it, the formation of which specially occupies the attention of the central direction. The greater part of the works composing these libraries are books written specially for prisoners, and others selected from educational works, written in a pleasing style and presenting clear and elementary notions of the national history, mechanics, moral tales, &c. As soon as the prisoners acquire the ability to read, they show a great inclination to it; but almost invariably they seek in books some diversion from their monotonous life, or food for the imagination, rather than a fund of solid knowledge; consequently few of the books read by them are of a didactic character, but the greater

part are novels or romances, of course always of an unimpeachable moral tendency.

§ 7. Schools do not exist in all the prisons of Mexico. Wherever they do, they are usually frequented by all illiterate prisoners.

The education imparted consists of the various branches of primary instruction and of religious and moral teaching. The progress made is satisfactory.

There are no libraries in the Mexican prisons. Generally prisoners do not read much, as they belong for the most part to the lower classes of society, where education is seldom imparted. Many are not able to read.

§ 8. Thirty-five to thirty-eight in the hundred will indicate, with sufficient accuracy, the proportion of prisoners in the Netherlands who are unable to read and write at the time of their entrance.

Schools exist in all penal establishments, except in the police and cantonal prisons. In the cellular prisons the instruction is given in the cells. All prisoners, up to the age of forty years, who do not know how to read and write, are obliged to receive that instruction.

The branches commonly taught are reading, writing, and arithmetic. The system of instruction leaves much to be desired. Reforms have been introduced or are in contemplation. In the two central prisons for juvenile prisoners, the system of instruction is all that can be desired.

There are libraries in all the prisons, which include books on morals and religion, histories, travels, &c. The books are specially classified according to the different religions. Most of the prisoners are fond of reading; they generally prefer books of history, travels, and the like. Their reading has a happy effect upon them.

§ 9. Only about one in the hundred of persons committed to prison in Norway is entirely illiterate.

Schools exist in all the penal prisons, but not in the minor prisons of the districts; yet, even in these, some instruction is given to ignorant young prisoners who remain for any considerable time. Instruction is given in religion, reading, and arithmetic; to some extent, also, in writing and music. Generally, the prisoners make good progress. Libraries are found in all the prisons. Those in the district prisons contain chiefly, though not wholly, religious books; those in the penal prison embrace, besides religious works, histories, travels, &c. Naturally the prisoners, especially those confined in the cell-prisons, apply themselves eagerly to reading, and evidently profit by it.

§ 10. In Russia very few of the prisoners, when received, are acquainted with reading and writing. Schools are gradually introducing into all the prisons of any size. Attendance is optional. As regards the kinds and degree of instruction imparted, no details can be given, as penitentiary education is still in its infancy. It is proposed, when fully organized, to make it broad and comprehensive. Mr. Savenke, a distinguished specialist, has already made some remarkable experiments and achieved extraordinary results in this department of prison work.

Libraries, though still but poorly supplied, are found in many prisons. The prisoners are fond of reading and of having books read to them, when there is no compulsion in the case.

§ 11. Nearly all the prisoners committed to the Swedish prisons can read and much the greater part write.

Schools exist in the associate prisons; in the cellular prisons, the inmates are instructed in their cells. All the illiterate are allowed to attend upon the lessons, unless they are too old to profit by them.

Instruction is limited to reading, writing, religion, the elements of history and geography, orthography, the four fundamental rules of arithmetic, and natural history. The progress is about equal to that made in the national schools, and is satisfactory.

There are small libraries in the prisons. The prisoners voluntarily spend their leisure time and their holidays in reading, either individually or in classes. In the latter case one of themselves or an officer reads aloud.

They prefer religious and moral books or accounts of voyages. On Sundays they practise sacred music. These exercises have an excellent effect both on the minds and manners of the prisoners.

§ 12. The degree of illiteracy varies in the different cantons of Switzerland. The official report sent to the congress from this country states the general average, on committal, of wholly illiterate prisoners at 17 per cent., and this, notwithstanding education is obligatory in Switzerland and in fourteen cantons is also gratuitous. These facts, taken together, show how prolific a source of crime ignorance is.

Schools are organized in all the improved penitentiaries, and in many other establishments lessons are given by the chaplain. It even happens that these duties are confided to a prisoner, if he is a teacher by profession, or if he possesses the necessary knowledge and aptitude. In penitentiary establishments in which schools are opened, all the prisoners, except those excused by age—above forty-five—and those subjected to the cellular *régime*, attend lessons in classes. The prisoners receive, on an average, from four to five hours' schooling per week. Those who are in the cellular stage are visited by the instructor in their cells, and there commence their course of instruction. Three classes are formed in the best organized penitentiaries. In the lower class the elementary branches only are taught; in the middle class progress is made toward the higher branches of study; and in the highest class are studied mathematics, physics, technology, and linear drawing, so far as these sciences are applied to arts and trades; and even, in some cases, foreign languages are taught.

The progress made differs much in the case of different prisoners. Many are remarkable for their zeal and power of acquisition, while others advance but slowly. The organ of thought, little accustomed to being used, has lost its force. The power of memory is often wanting, and the result in these cases is a stupefaction, which leads to indifference. Still, the average progress made is highly satisfactory, especially in the case of juvenile delinquents.

Libraries are found in all the prisons. In those of the cantons where prison discipline is little advanced, the number of books is limited, and works exclusively religious predominate. In the penitentiaries which are better organized the libraries are composed of moral and religious books, of works of general history and the history of Switzerland, of biographies, travels, ethnography, natural history, works on mechanics, agriculture, belles-lettres, &c. Romances of a moral character are not excluded.

The prisoners read, relatively, a great deal in the penitentiaries where they pass Sunday in their cells, and where they have at their disposal a variety of works. They generally prefer moral tales, narratives of voyages, biographies, Swiss and general history, and works of popular science. Reading is found to have a very beneficial effect upon the prisoners. It enlarges the circle of their general knowledge, and by fuller explanations of what they had learned in the way of routine, it develops also their practical knowledge. It is by keeping their minds

continually occupied by labor, or by moral and intellectual recreations, that that self-respect is oftenest awakened in prisoners which constitutes the best guarantee against secret vice. These elevating and noble agencies calm an ardent imagination, and often put to flight ideas inspired by base passions and by vicious and criminal sentiments.

§ 13. The general condition of prisoners in the United States, in point of education, is low as compared with the whole population of the country. Yet it differs much in different States. In Massachusetts, for a period of eight years past, the statistics show very nearly one-third of all prisoners to be wholly illiterate; yet in the highest prison, at Charlestown, the proportion of illiterate convicts since the beginning of 1864 has been scarcely more than one in ten. In the Philadelphia prison, (eastern penitentiary,) out of 7,092 prisoners received between 1829 and 1872, about one-fifth (1,418) were wholly illiterate, and almost a sixth more (1,124) could only read. In the western penitentiary of Pennsylvania, at Pittsburgh, the proportion of illiterate convicts is less, (42 in 375, or one-ninth,) while those who can read only is still smaller (47 in 375, or one-eighth.) In the county prisons of Pennsylvania, more than a third of the prisoners are illiterate, and the same is true of New York; but, in the large Western States of Ohio, Illinois, Michigan, and Wisconsin, the proportion of the illiterate is smaller, and probably does not exceed one-fourth. Out of 8,744 convicts received by Mr. Brockway in Michigan, 2,100 were wholly illiterate; but in the Michigan state-prison, only 42 out of 356, or less than one-eighth, were wholly illiterate, though only 286, or three-fourths, could both read and write. In the Iowa state-prison, 34 out of 216 could neither read nor write; in the Kansas state-prison, 61 out of 303; while 42 more could read indifferently, but not write. In California, 226 convicts in the state-prison out of 732 (nearly one-third) were illiterate. But when we look at the late slaveholding States, the proportion of illiteracy greatly increases. Of 669 convicts in Maryland, 394, or nearly three-fifths, could neither read nor write; of 389 in North Carolina, 264, or more than two-thirds, can neither read nor write; in the other fourteen Southern States the proportion is probably about the same. Practically, then, two-thirds of the prisoners in these sixteen States are illiterate, while in the rest of the Union something more than one-third are so, probably; so that about half the 38,000 prisoners now in confinement are practically without education, and a large proportion of the remainder possess it to only a very limited extent. The women in prison are not so well educated as the men, and the short-sentenced convicts, as a rule, not as intelligent as those sent to higher prisons.

The provision made for the mental improvement of prisoners is better now in most of the States than it was a few years ago. Public attention has been drawn to the subject, and, in a few prisons, not only libraries and schools, but lectures have been established, with a view to the general education of the convicts and to aid in their reformation. The best instance of this prison instruction in the United States is probably found in the Detroit House of Correction, where a school-system was established in 1869, when the number of convicts was about 360; on the 1st of May, 1872, it was 402, of whom 296 were men and 106 women. During the year 1871 the average number of convicts in the prison was 385, in school 219, or nearly two-thirds of the whole number. Of this average, 141 were men and 78 women, the schools being separate. In his last report, Mr. Brockway says:

This system was introduced among the prisoners to aid their reformation, and is now conducted for this purpose; not so much to relieve the monotony of imprisonment and to impart the ability to read, write, and cipher, for the convenience of these accom-

plishments, as to discipline the mind and fit it to receive and to evolve in the life the thoughts and principles that constitute their possessors good citizens. Attendance upon the school is made obligatory, and the intellectual tasks are required, as are the industrial. The sessions of the general school are two and one half hours each, on two evenings every week, and are for recitations chiefly. The writing-school is also held on two evenings each week for both men and women, and the men's writing-class is followed each evening with a normal or teachers' class, in preparation for the general school. The women associate a singing-exercise with their writing-class on each evening. All prisoners who attend school are supplied with a light in their cell, for study, and all draw books from the library. Every Saturday, at 5 o'clock, all the prisoners in the institution (numbering now 440) assemble in the chapel to listen to a lecture. This is the crowning feature of our educational effort; during 1871 we had forty-six lectures—carefully-prepared, well-delivered lectures—many of which had been delivered to first-class audiences of citizens, and were worthy of a place in any lyceum-course.

The following details, given by the teachers, are too important, as well as too interesting, to be omitted:

The twenty-one classes into which the school has been divided have been taught by twenty-eight teachers, selected with a single exception from the prisoners themselves. The changes in teachers have been much less numerous than was the case in previous years. It has been noticed that men sentenced for considerable periods make the best teachers, not simply from the fact that they take a greater interest in what must occupy them for some time, but because they have more force of character, more decisiveness. Some of the worst men, morally, have made the best teachers. From the monthly record of progress which has been kept, it appears that the work done by each of the prison classes in arithmetic, which has been the subject in reference to which chiefly the school has been graded, has averaged as much as that which is usually done by three classes of corresponding rank in our public schools. In other words, a year and a half school-work in arithmetic has been done during the last forty-five evening sessions.

The song of opening, the brief talk upon some scientific theme, the lessons of the evening, have been listened to with attention and entered upon with avidity. There is evidence on every hand that the school has furnished the themes on which much thought has been bestowed in the work-shop and in the cell. The pleasure in the business of the school-room, the evident delight of the men in the work assigned them, the progress they have made in manners and in studies, have been much greater than I at all anticipated. I think no one before the trial would have said that men long unused to study, or who had never known it, working all day in the shops, with two evenings' instruction per week by their fellow-prisoners a little in advance of themselves, would in main studies make two or three times the progress which the pupils in our public schools make under the most favorable circumstances; and yet such has been our constant experience. Three years ago the women's school had but one teacher. There were none among the prisoners competent to assist in the work of teaching. There are at this date seven regular assistants teaching quite successfully. They have been educated for it in the school; and while they are teaching others they receive also practical instruction, not only in the lessons which they are studying, but in methods of teaching. The school is now very well graded and classified. Nightly records are made of each individual in school, and a system of monthly examinations and reports is in operation, which not only tests the progress of the pupils, but measures the success of the teachers also. Hence the new school-year of 1872 opens very auspiciously.

This testimony is the more reliable, especially in what relates to the comparative progress made by the prison-students and by the pupils in the public schools, inasmuch as Mr. Tarbell, the principal of the male prison-school, is also principal of one of the most important of the public schools of Detroit, and hence speaks with thorough knowledge of both classes of schools and scholars.

Mr. Brockway makes this frank confession and gives this sound advice:

In view of the benefits of the school it seems incredible that I could have spent more than twenty years in the management of prisoners, and never, until 1868, have introduced this measure. Let me urge all who can do it thoroughly to put this feature into their management, as indispensable to satisfactory reformatory results, working and waiting for such changes in the law as shall enable us to carry the education of every prisoner we receive to a point promotive of his pecuniary prosperity, his conscious self-respect, and his probity of deportment.

General Pilsbury, of the Albany penitentiary, the teacher of Mr. Brockway in general prison management and discipline, is, as regards penitentiary education, nobly following the example of his distinguished pupil. He has fitted up a large and commodious school-room, giving a desk to each convict-scholar, and other accommodations equal to those afforded in the best public schools of our large cities. The work of instruction is vigorously prosecuted and is yielding satisfactory results.

Prison-schools are organized or instruction is given at the cell-door in many of our state-prisons; but it is far from being as thoroughly organized or as effective as at the Detroit House of Correction. Of the 16,000 prisoners in the state-prisons of the Union at the present moment, from 4,000 to 6,000 may be receiving scanty instruction in schools of some sort. Of the estimated 22,000 prisoners in common jails and houses of correction it is safe to say that not more than 3,000 are receiving any scholastic instruction whatever. We have already seen that about 20,000 of the 38,000 prisoners in the whole country are practically illiterate, and certainly less than 8,000 of these are under instruction in the prisons. Such a condition of things calls loudly for reform, and it is, therefore, a cheering circumstance to be able to add that the number of prison-schools is constantly increasing, and that their character improves day by day.

The condition of penal institutions in the United States is much better in respect of libraries than of schools. Most of the state-prisons and houses of correction have libraries, some of them large and excellent. Probably the aggregate number of volumes in these two classes of prisons is 25,000. With the exception of the States in which slavery prevailed till within a recent period, of prisoners confined in the state-prisons from eight to nine-tenths are able to read sufficiently well to be entertained and profited by it. The taste for reading, thanks to the good libraries in our prisons, has become quite general with the prisoners; and there is a singular unanimity among the officers of prisons as to the high advantage they derive from the indulgence of this taste. With one voice they bear testimony to the value of the libraries in communicating useful knowledge to the prisoners, in elevating their minds, in beguiling many an otherwise tedious hour, in making them cheerful and contented, in affording material for profitable reflection, in supplying good topics for conversation with them, in improving the discipline, and in constituting one of the most effective of reformatory agencies.

§ 14. The department of education in the English convict-prisons, including the care of the library and the distribution of books among the prisoners, belongs to the chaplain. Books are supplied to the prisoners, both of a purely religious and of a more general character; and those who are uneducated are taught by a staff of schoolmasters at least the elements of reading and writing; those who have already some knowledge have opportunities and encouragement in improving themselves. As a knowledge of reading and writing affords so much opportunity for mental and moral improvement, and may have so important an effect on a prisoner's well-being in after-life, great inducements are offered to prisoners to exert themselves to attain it, by rendering some of the subsequent privileges they may gain conditional on their being able to read and write. For example, no convict can be promoted to the first class unless he can read and write; and, after he has been under instruction a sufficient time, he is obliged, if he wishes to enjoy the privilege of communicating by letter with his friends, to do it himself, and without assistance. Of course, exceptions to this rule are made, in the case of men who, from age or mental incapacity, cannot be expected to

acquire even the elements of knowledge. Half-yearly examinations are held to ascertain the progress made by each prisoner, and the result is, in the main, satisfactory. Of 775 prisoners discharged from the prisons at Chatham, Portland, and Portsmouth, the 158 who could neither read nor write when convicted had learned to do both while in prison; and most of the remainder had made advances in the knowledge which they had previously possessed.

Of 157,223 committed to the county and borough prisons of England in 1870, 34 per cent. could neither read nor write, and 62 per cent. could do one or both imperfectly, leaving only a residue of 4 per cent. who had mastered these important arts. Most or all of these prisons have schools and libraries. But the report submitted by the inspectors to the congress affords no information on these points beyond this naked statement.

§ 15. Of prisoners committed to the Irish convict-prisons, 22 per cent. of males and 63 per cent. of females are wholly illiterate.

Libraries exist in all the convict-prisons, but they do not appear to be very well provided with books, beyond those of a religious character, which are chiefly Bibles, prayer-books, and catechisms of the Episcopal and Roman Catholic churches. Schools are organized in all the prisons, and the work done in them is highly commended by the inspector of public schools.

CHAPTER VI.

PRISON LABOR.

§ 1. Penal labor, as such, does not exist in the prisons of Austria, although difficult and disagreeable work is sometimes awarded by way of disciplinary punishment. A considerable variety of trades is pursued in the Austrian prisons. No less than twenty are named, and the statement ends with an *et cetera*. Besides handicrafts pursued within the prison-walls, trustworthy prisoners who so desire are employed in open-air work, as farmers, gardeners, masons, bricklayers, laborers on streets and railways, stone-breakers, &c. Latterly prisoners sentenced by the higher courts are much employed in out-door work. The effect of this is found beneficial in two ways: 1, the prisoners so occupied, the greater part of whom are serving out their first sentences, are thus saved from the evil effects of association with other prisoners; and, 2, their health is better, and hence their power of production while at work is greater.

The system of hiring the labor of the prisoners to contractors is preferred in Austria, provided, always, that contractors of a suitable character can be found; otherwise, the prison-direction manages the labor on behalf of the state. The contract-system is preferred for two reasons: first, because it prevents loss and damage; and, secondly, because it enables the officers to devote themselves entirely to what is deemed their proper duty, the care of the prisoners. There is, nevertheless, confessed to be a grave disadvantage connected with this system in the fact that an outside element is thus introduced among the prisoners unfavorable to their moral improvement. Still, it is believed that this disadvantage may be reduced to a minimum by a careful selection of contractors, foremen, and workmen. The average proportion of prisoners for the last three years who were ignorant of a trade at the time of committal was, in the higher prisons, men, 8 per cent.; women, 24 per cent.; in regard

to the other prisons, statistics are wanting. Every such prisoner learns a trade in prison, if he is sentenced for a sufficiently long time. Pains are taken to guide the prisoner in judging of his own capability, that so he may learn to value it, and be thereby induced to earn an honest living. Thus he is taught, not only how to work, but how to estimate the worth of an upright life; and he is quickened in his industry by receiving a portion of what he earns during his incarceration.

§ 3. No distinction is made in the prisons of Denmark between penal and industrial labor. The contract-system is in use here. It is regarded as the best, both economically and with regard to reformatory effect. However, it is hedged about with the greatest care, and all intermeddling by contractors with the treatment of the prisoners is completely cut off. Labor is regarded not merely as a source of revenue, but rather as an essential condition of the due execution of the sentence, and as a necessary agent in the moral regeneration of the prisoner. The profit derived from it does not meet the current expenses of the prisons, since these, including the administration, amount to \$70 a year *per capita*, while the profit of the prison labor is only about \$40.

§ 2. Penal labor, as distinguished from industrial, does not exist in the prisons of Belgium. The report enumerates thirty industrial occupations as those in which the prisoners are engaged. The employments introduced into the prisons are chosen, preferably, from among those most likely to afford the prisoners, after liberation, the means of an honest livelihood. It is held in Belgium that labor ought not to be imposed as a punishment, since the first necessity of man is labor, and the first sentiment to be developed in him is the love of labor. The liberated prisoner ought not to carry with him, on his discharge, the idea that work is a punishment in this world, and that he has suffered it long enough during his imprisonment to hasten, at the hour of his deliverance, to free himself from its chains. Labor should be exhibited to him in the prison (as it is in society) as the source of the physical and moral elevation of man. He ought, in all things, so to identify the life of man with the necessity and the attraction of labor that even in captivity it should be still, if not the image of happiness, at least a solace attached to its exercise and an idea of punishment from its privation. In a word, if labor ought to enter as a penal element into penitentiary imprisonment, it is not in the use but the privation of it. Undoubtedly, labor in penitentiary imprisonment ought to be obligatory; but it ought not to be imposed on the prisoner under the empire of constraint, but as an obligation to which his reason, his interest, his necessities, everything, ought to urge him. Penal labor is, therefore, repudiated in Belgium as inconsistent, in its very nature, with the fundamental idea of a true prison discipline.

Two systems of labor are found in the Belgian prisons, namely, that of letting the labor to contractors and that of working it by the state. Each of these systems is thought to have its special advantages and disadvantages. The former, it is claimed, yields the largest revenues and offers facilities for diversifying the labor of the prisoners and affording them occupations suited to their special aptitudes, while the latter offers certain advantages, (though it is not stated what they are,) when it is a question of labor of easy execution or of the creation of products for the use of the administration itself. Care is taken to state in the report sent in by Belgium that the contractors are placed under the immediate supervision of the directors, a statement which is tantamount to an admission that the system is extremely open to abuse, and needs to be guarded and watched with the greatest circumspection.

Only one system of letting the labor prevails—that of awarding it to contractors who offer remunerative prices and adequate guarantees of solvency and morality. All the prison-keepers are required to be artisans, and they are charged, not only with the supervision of the prisoners belonging to their several sections, but also with instructing the prisoners in the trades which they are learning. From 60 to 70 per cent. of the prisoners have no regular business or assured means of support when committed. It is looked upon as a point of the greatest importance to impart to them, during their imprisonment, the art of self-help by teaching them some regular business and training them to the love of work; the more so, as it is believed that ignorance of a business and aversion to labor are among the chief causes which impel men to the commission of crimes against property. Hence special effort is made to give to the prisoner a clear perception and strong realization of the necessity of mastering a business while undergoing his punishment, so that, after his release, he may be able to work for his food, his bed, his clothing—in a word, to assure the satisfaction of his essential wants.

§ 4. In the prisons of France there is no penal labor, as that expression is commonly understood. The penal system is no longer founded, as formerly, on suffering and terror. Corporal punishments have disappeared from it. What is desired at present is to punish the criminal; what is sought as the end of that punishment is his reformation. Therefore, industrial labor alone is found in the prisons, obligatory in the case of those under sentence, permitted in the case of the arrested and the accused. It is thereby sought to prevent the dangers of idleness and to form the taste and the habit of labor. In the smaller prisons there is difficulty in organizing the labor. In the central prisons the labor is thoroughly organized; if any are without occupation, it is the exception, and not the rule. Large industrial workshops in these establishments continually present a scene of busy toil. Different industries, to the number of fifty or sixty, have been introduced into the male central prisons. The principal are shoe-making, the manufacture of hosiery, weaving, button-making, cabinet-work, lock-smithing, the manufacture of hardware, tanning, &c. There are, besides, three establishments in Corsica and one in Belle Isle, in which the prisoners are engaged in agricultural labors. Sewing, which can be applied to very different kinds of work, is almost the only industry pursued in the female central prisons. Piece-work is the general rule. With a view to avoid the competition of prison labor with free labor, the rates of payment for the work done have to be studied and regulated by the administration, which carefully considers before-hand the different interests involved. The rates must be the same as those paid to free industry for the same kinds of labor.

The contract system of labor prevails in most of the prisons of France, and is the one to which the administration gives its preference.

Of the men committed to the central prisons, 5 per cent. had no regular calling or business prior to commitment; of the women, 12 per cent. Evidently this cannot mean that so large a proportion had learned trades and become artisans. The administration exerts itself, as far as possible, to cause to be taught to the prisoners previously without a regular business some calling which will enable them after liberation to gain an honest living.

§ 5. Germany reports: There is no merely penal labor in the prisons of any of the German states.

(1.) In the Grand Duchy of Baden, the labor of the prisoners is not let

to contractors, but is managed by the administration itself. This system is preferred because it enables the authorities to observe the state of each prisoner and to exclude all outside elements prejudicial to discipline and reformation. It is sought to introduce variety of trades, so that too many may not be employed on any one to the injury of private industry. An extensive market and the highest prices are sought.

Forty per cent. of the prisoners are ignorant of a trade on entry. To impart to these a trade and the power of self help, if they have the requisite ability and stay long enough in prison, is the principal work. This result is arrived at by improving the prisoner's morals, by scholastic and industrial instruction, and by the whole prison treatment.

(2) The several industries in the Bavarian prisons are conducted by their respective administrations. When prison-labor is given to contractors, another authority is placed between the administration and the prisoner, which cares only for making the greatest profit out of the prisoner's work. Not only is discipline thereby interfered with, but the character of the punishment is changed and its purpose is placed in jeopardy. From the disciplinary and penitentiary point of view, the giving of prison labor to contractors is condemned in Bavaria, even though the profit derived therefrom may be greater than if the administration carried it on.

The proportion of prisoners who, on entering prison, are ignorant of a trade is 29 per cent. It is made a special object to impart a trade—and so to teach the art of self-help—to all prisoners who have the necessary capabilities and whose terms of sentence are long enough to permit it.

(3) In the prisons of Prussia more than fifty different trades are carried on by the men and ten by the women; a portion of the male prisoners are also occupied in farm-work.

The plan commonly adopted in the prisons of utilizing the labor of the convicts is that of letting it to contractors; what work shall be given to contractors is settled by the administration. It has absolute control in the selection of prisoners for the performance of the work and over its execution. It is deemed important to have such a number and variety of trades that, in allotting prisoners their work, due regard may be had to their trades before admission and also to their capacity. Each particular branch of industrial labor is, by the regulations, given to one contractor; the system of "general contracts" has no existence in Prussia. The contracts are so made as to exclude all direct relation between the prisoner and the contractor. It is conceded that the state loses financially by this system, but is claimed that it simplifies the administration.

About 5 per cent. of the inmates have knowledge of some trade on entry. As it is considered highly important for a prisoner during his imprisonment to learn how to help himself on his liberation, it is made a special object to teach him a trade, if he had not learned one before. In addition to school-instruction and apprenticeship to a trade, he is bound, in order to learn the art of self-help, to keep himself strictly clean, take due care of his clothes, see to the cleanliness of his cell and all utensils, and to the proper order of his bed.

(4) Saxony, one of the most industrial countries, produces in her prisons almost all the different articles of industry and trade. The work is partly given to contractors, who are entirely dependent on the administration of the penitentiary, and is partly managed by the latter itself on its own account. The system of giving the work to contractors, who are in entire dependence on the administration, has the preference, because, as it is thought, the officers cannot be at the same time good

tradesmen and good officers, and because the interests of the two would be opposed and conflicting. The profits of the prisoners' work cover from about one-third to one-half of all the prison expenses.

(5) Besides the necessary work done for the prison itself, there are carried on in the prisons of Würtemberg some fifteen to twenty different trades by the men, and eight or ten by the women. Both industrial systems find place—that of letting the labor to contractors and that of directing it by the administration. The opinion is held that preference should be given to the one or the other, according to the nature of the work.

More than half the prisoners, when received, have a knowledge of some trade. As far as possible, the prisoner is put at the same trade in prison at which he worked before, or he is taught some other, selected by himself, of those carried on in the prison. The same is true of those who had not learned a trade before their imprisonment.

§ 6. In the penitentiary system of Italy there is no labor bearing an exclusively penal character. It is sought to give to the industrial education of the prisoners the turn which seems best suited to them, and to impart the trade most easily mastered. Labor has no other aim in the Italian prisons than to overcome the natural propensity to idleness in the criminal, to accustom him to a life of activity and hardship, and to give him the means of obtaining an honorable livelihood.

The industrial arts mostly practised in the penitentiaries are those of the shoemaker, carpenter, blacksmith, and weaver, and in the bagnios the prisoners are made agriculturists, laborers in the salt-deposits, and workers in cotton, hemp, &c. Until 1868, the industries of the prisons were managed by the administration. Since that time, as an experiment, the contract-system has been introduced into eleven prisons. The question, Which is the best of these two systems? is so complicated and difficult that the administration is unwilling to pronounce an opinion till it has made further trial of each.

§ 7. Penal labor does not exist in Mexico. The sentiment of the commissioners who prepared the report for the congress is opposed to such labor, first, because it does not contribute to the moral improvement of the prisoners; and, secondly, because, to render it effectual, it would be necessary to use actual violence, which always humiliates and degrades those who suffer it.

The contract-system is not found in the prisons of Mexico.

It is considered very important that during their confinement prisoners should learn some trade that may enable them to earn their livelihood, as the chief reason why they relapse into crime is that, after they have served their time, they do not find any work; and the want of this reduces them to misery and leads them to commit fresh offenses.

§ 8. In the penitentiary establishments of the Netherlands unproductive or merely penal labor is unknown. Industrial labor, the only kind in use, is everywhere directed by the administration. But both systems of labor, the contract-system and the system by which the labor is utilized on account of the state, have place.

Taking the whole country together, it is believed that about one in four will correctly represent the proportion of prisoners without a trade at the time of commitment. It is regarded as a matter of the highest importance to impart to prisoners during their incarceration the power of self-help, and this result is diligently sought by teaching them, to the utmost extent possible, some useful calling.

§ 9. Industrial labor alone is pursued in the prisons of Norway, and it is managed exclusively by the administration. Many prisoners learn

a trade while in prison. Effort is made to train them to habits of industry, and it is constantly set before them that, of all the causes of crime, idleness is one of the most prolific.

§ 10. In Russia, a marked difference between different kinds of labor is beginning to show itself. Industrial work, which scarcely existed in times past, is now making great progress, owing to the advantages it offers to the prisoner, who sees that he can thereby best escape relapse. Penal labor alone cannot, it is held in Russia, have a beneficial influence. This is clearly proved in Siberia, where the number of escapes is counted by thousands. An intense hatred of the authorities and a strong desire of vengeance are the result when penal is not accompanied by industrial labor, which latter is the sole means of reformation. Industrial labor has produced good results in Russia only when let to contractors. It is now a question whether penal labor shall not be let in the same way. It is held that the administration should not interfere with its direct duties by the care of commercial undertakings.

A thoroughly organized bureau of statistics has but just been established by the ministry of justice. It is therefore impossible at present to give the exact proportion of prisoners who are without a trade when committed; but it is certainly more than one-half. To impart the knowledge of a trade to prisoner ignorant of such knowledge is a special point in the reforms now projected. To give him the power of self-help is regarded as of the very highest importance, since penitentiary science, in its whole scope and essence, is but a struggle against the tendency to relapse.

§ 11. There is no penal labor in the prisons of Sweden as contradistinguished from that which is industrial. In the associate prisons for men, most of the prisoners are occupied in cutting granite for buildings, for pavements, &c. In one prison a part of the inmates are engaged in cutting up pine-wood for matches, another part in making fine joiners' work. In still other prisons, linen and woollen cloths and blankets are manufactured, as well as all the garments and bedding for the prisoners and a part of the clothing for the army. The women are engaged in making textile fabrics, in all sorts of sewing and binding, in glove-making, &c. In the cellular prisons various kinds of labor are performed by the men, such as tailoring, shoe-making, joiners' work, &c.; and by the women, weaving, sewing, knitting stockings, &c. Recently the manufacture of match-boxes has been their principal employment. Industrial labor has the effect to give the prisoners habits of order and diligence, and to render the violent more tractable.

All the industrial labor in the associated prisons is let to contractors, except what is done for the prisons themselves. Nevertheless, the opinion is held that, to secure the best results in respect of moral reformation, all the industries should be under the direction and control of the prison administration itself, and not that of contractors.

In Sweden the inhabitants of the towns form only 12 per cent. of the total population. In the country men are chiefly farm-laborers or miners. The consequence is that only a small proportion of prisoners had learned a trade prior to their committal—not more, indeed, than 10 per cent. To put the prisoner in possession of a trade, by which he may earn an honest living after his release, special trade-masters, during recent years, have been employed to give the necessary instructions in the cellular prisons. Further measures in this direction will be adopted at an early day. It is in contemplation to grant the greater part of his earnings to every prisoner who, while in prison, has learned

and worked at a trade capable of supporting him. It is believed that this plan will be effective in the reformation of numbers of criminals.

§ 12. The distinction between penal and industrial labor is made in the Swiss prisons by law only in the cantons where there still exists the system of the old hard-labor prisons, in which a certain class of prisoners are subjected to public labor, viz, in sweeping the streets, making roads, diking rivers, &c. This distinction is not made in the prisons in which the reformation of the prisoner is proposed as the end. From twenty to thirty of the more common and more useful trades are taught in the Swiss prisons.

Industrial labor in the prisons of Switzerland is managed by the administration itself. The attempts which have been made in some prisons to let the labor to contractors for a fixed daily sum have been very speedily abandoned. Orders are received in the penitentiaries. The raw material is furnished by the administration or by those who order the work; the tools belong to the establishment. The keepers, who act at the same time as foremen, superintend the work and calculate the value of the workmanship and of the raw material employed. Account is taken in this calculation of the prices-current. Everywhere they endeavor to deliver merchandise carefully manufactured; and thus, as a general thing, the industrial products of prisons are in good repute. Preference is given in the modern penitentiaries to the management of the administration over that of contractors in the interest of penitentiary training. The administration, being supreme, can introduce a greater variety of industries, and suit to these latter the different aptitudes presented by the prisoners. The consequence of the distribution of the prisoners on a larger number of industries is that each branch is restricted to a relatively small number of workmen, and hence free labor has no occasion to fear an injurious competition. The endeavor is made to create a demand for the products of prison labor rather by the excellence and solidity of the manufacture than by the cheapness of the price. Were it otherwise, the penitentiaries, which ought to be at the same time industrial schools, would be turned aside from their proper end. In Switzerland it is found that penitentiary training is incompatible with the system of letting the labor of the prisoners to contractors. It is the administration alone that can feel an interest in teaching a trade to every prisoner during his stay in prison, so that at the time of his liberation he may be independent and able to gain an honest living.

The number of prisoners not having a regular business at the time of their commitment is relatively considerable. Nevertheless, the tendency is shown to be toward a diminution, if comparison is made between the results of statistics for the last twenty years in the penitentiary of St. Gall. This belongs evidently to the progress of civilization.

Of criminals committed to the Swiss prisons, about 50 per cent. make no claim to have learned a trade; and, of the 50 per cent. who do so claim, there is scarcely a fourth part who can produce a respectable piece of workmanship. These facts clearly show that the want of a trade is not without its influence in the law which controls the causes of crime. Hence it is sought in all the penitentiaries—particularly in those more recently built and organized upon a rational plan—to give a trade to the prisoners, and above all to juvenile delinquents, who have to undergo an imprisonment of one or several years. In all the penitentiaries it has been remarked that numbers of the prisoners acquire in a short time the ability to do that which free workmen would be able to execute only after a long apprenticeship. Apprenticeship to a trade which requires a certain degree of intelligence, and is, at the same time,

to the taste of the prisoner, is one of the principal agencies in reforming him. Without industrial labor of this kind, no satisfactory result can be expected from a penitentiary system, and relapses will be inevitable. A trade learned in the establishment is held to be worth more, as regards the support and succor of the prisoners, than a patronage society. It is well understood in the cantons somewhat advanced in penitentiary science that it is important, in order to prevent relapses, not only to make the prisoner an able workman, but also to teach him during his incarceration to help himself. In this view, there have been introduced in most of the prison regulations arrangements by which zeal and diligence in labor and the habit of saving are stimulated. The scale of the *peculium* rises in many of the establishments with the augmentation of labor. In the better organized penitentiaries the further effort is made to attain this result by a careful apprenticeship to the trade chosen by the prisoner, by making him acquainted with the nature of raw materials, the places from which they are obtained, and their market value; also, with the tools and machines employed, the price-current of the articles manufactured, and the manner of calculating the value of the workmanship. The prisoners are more or less associated with the administration through their industrial labors. If by their good conduct and their aptitudes they come at length to deserve the necessary degree of confidence, they are called to fulfill the functions of foremen. There is thus afforded to every prisoner the opportunity of developing and manifesting his power of initiative. Technical works and journals are placed in the hands of the workmen on different branches of industry. Writings of the character of Franklin's Poor Richard afford material assistance in this system of penitentiary education.

§ 13. All the labor done in American prisons from which revenue is derived is of the kind known as industrial, in contradistinction from penal, which does not exist among us. But there is scarcely any kind of industrial labor which does not find a place in the prisons of the United States. In Alabama and Texas the convicts build railroads, in Mississippi they raise cotton, in Tennessee and New York they work mines; in many of the States they cultivate gardens or do farm-work. But the prison employments are generally mechanical, and especially deal with work in wood, leather, and the metals, though stone-work is also done on a large scale where prisons are building. This was formerly so common an occupation for American convicts that "hammering stone" became a common term for imprisonment. Quarrying stone for sale or for making quicklime is much practised in the great prisons of Joliet (Illinois,) and Sing-Sing (New York,) the largest in the country. At the Auburn prison, agricultural tools are extensively manufactured; in the Ohio state-prison many convicts are employed as saddlers, wheelwrights, and blacksmiths; in the cellular prison at Philadelphia, (the eastern penitentiary,) the employments, being pursued in the cells, are mainly sedentary, such as shoemaking, weaving, and the lighter kinds of wood-work; in Massachusetts ornamental iron-work, brushmaking, shoemaking, and sewing by means of the sewing-machine are common prison employments. In the Maine state-prison, the warden, being a carriage-maker, has introduced that branch of industry; in the prison of Northern New York, at Dannemora, a great iron mine furnishes ore, which is smelted, forged, and wrought into nails by the convicts; in the Michigan state-prison, at one time, tanning leather was largely practised; in the Detroit House of Correction chair-making has been the

chief industry. In fact, there is scarcely any mechanical occupation that has not been carried on in some one or more of our prisons.

In general, the labor of the convicts is hired by contractors at a fixed sum per day, and this varies from a few cents to something above a dollar a day, the highest contract wages being paid at the Massachusetts prison. In a few of the prisons, perhaps a tenth part of the whole number, the whole prison labor is managed by the prison administration, and in nearly all some part of the labor is so managed, especially where the building or enlarging of the prison is going on. It requires great skill and business capacity in the head of a prison to manage its industries, and for this reason such management is extremely liable to failure. On the other hand, the contract system often introduces moral and financial corruption, injures discipline, and demoralizes the convicts.

A few years ago the expenses of nearly all our state-prisons exceeded their earnings; but a change has been going on in this respect, and there is now fully a fourth part of them that earn more than they expend. Every one of the six New England States reports a profit from its state-prison, ranging from \$20,000 a year in Massachusetts to \$1,200 in Connecticut; and the excess of earnings over expenses in the six prisons (containing an average of some 1,100 convicts) was last year above \$39,000. With a smaller number of convicts than this, Ohio shows an excess of earnings amounting to more than \$40,000. Under skillful and honest management, all our state-prison convicts might perhaps earn their own support and \$30 a year besides; but two-thirds of them, and perhaps three-fourths, fall far short of this. In the eastern penitentiary, of Philadelphia, with about 600 convicts, the annual deficit, including officers' salaries, is nearly \$60,000, or \$100 for each convict; in the three great prisons of New York it averages more than \$50 for each convict; in Maryland it is about \$30 for each convict, and so on. In the county and district prisons very few of the convicts support themselves by their labor, but the Boston House of Correction, the Rochester Penitentiary, the Albany Penitentiary and the Detroit House of Correction are self-sustaining, and the two last-named prisons earn each a considerable surplus every year. The net cost of supporting all the prisons above their earnings must be nearly \$3,000,000 a year for the whole country, since there are 38,000 prisoners, and the average annual cost of each one above his earnings cannot well be less than \$80.

§ 14. Penal labor, except so far as oakum-picking may belong to that category, is not used in the convict-prisons of England. It has for many years been an established principle in English convict-prisons to endeavor to instil into the convicts habits of industry, to develop their intelligence by employing them on industrial labor, and to facilitate their entering the ranks of honest industry on their discharge, by giving them facilities for acquiring a knowledge of trades. These objects are fortunately conducive to another very desirable result, viz., that of making the prisons self-supporting in various degrees; some of them doing an amount of labor the value of which more than covers the cost of their maintenance.

The gross cost for maintaining the convict establishments in England during the financial year 1871 was £313,633, and in the same period the earnings of the convicts amounted to £228,244, or £22 19s. 4½d. per head on the average number. The net cost of the prisons, after deducting the value of the prisoners' labor, amounts only to £85,389, or £8 10s. per head.

The contract system is not in existence in the English convict-prisons, the industries being managed wholly by the administration.

In the county and borough prisons, great prominence, as a rule, is given to penal labor, such as the tread-mill, crank, shot-drill, oakum-picking, stone-breaking, &c. In a few, industrial labor is well organized, and its products go far towards defraying the ordinary expenses of the establishments; but in general the earnings of prison labor are exceedingly moderate.

§ 15. The labor-system in the Irish convict prisons is substantially the same as that in the English prisons of the same class, except that at the intermediate prison at Lusk, to which there is nothing corresponding in the English convict system, the men are mostly engaged in farm-work.

CHAPTER VII.

SANITARY CONDITION OF PRISONS.

§ 1. The system of drainage in the Austrian prisons leaves little to be desired. The water-supply is reported as always sufficient in quantity, and for the most part good in quality. In the southern provinces, during the hot season, as the water in many prisons is supplied from cisterns, it is not as good as might be wished. In such prisons a modicum of vinegar is supplied to the prisoners, to be mixed with the water. Most of the prisons are well ventilated. The cells are thoroughly cleansed and painted every year. The corridors are cleaned daily and the floors scrubbed with sand and water at least once a month. The cleansing and disinfecting of water-closets take place every day. Personal cleanliness is rigorously exacted. The body linen is changed weekly and the bed linen monthly. The prisoners must take at least four baths a year. The collective prisons are furnished with portable water-closets; the cellular have in each cell a fixed closet, which stands under a ventilator reaching to the roof. The dormitories and cells are lighted by gas or oil, mostly the latter. The heating of the prisons is done partly by iron stoves, partly by hot air, with necessary precautions for keeping a sufficient quantity of moisture in the atmosphere. The bedsteads are generally of wood; in some cases, however, of iron. The bed is of straw, with pillow of the same or of African forest hair; two sheets, and one or two blankets, according to the season. The bed for the sick is the same, but the linen is finer, and it has a cotton coverlet. Nine hours are given to sleep. The remaining fifteen are divided thus: Religious services, one and one-half hours; meals, exercise, and rest, two and one-half hours; labor, ten and one-half to eleven hours; attendance at school, (which is taken out of the hours for labor for those who frequent the lessons,) two hours. Sick prisoners are placed in the infirmary or hospital, and cared for according to the doctor's orders by nurses taken from among the prisoners who show themselves worthy of such confidence; but those prisoners who have only slight ailments are treated in their rooms or cells. Insane prisoners are taken to the public lunatic asylum. The diseases most frequent are those of the respiratory and digestive organs and of the skin and cellular textures. The average number of sick during the years 1870 and 1871 did not vary much from 6 per cent. The death-rate in prisons for sentences exceeding a year was $3\frac{1}{2}$ per cent., while in prisons to which the sentences were for less than a year, it scarcely exceeded one-half of one per cent.

§ 2. The sanitary state of the Belgian prisons is reported good. The

drains for waste-water and night-soil are cleansed every week by a strong current of water rushing through them, so that no emanations dangerous to health can ever issue therefrom. Water is furnished in amplest supply and of good quality.

The ventilation and heating of the cells are effected in the following manner: The apparatus for heating is placed in the cellar. The fire is made in the center of a double cylinder filled with water, which forms the boilers for its propulsion. From the upper part of each of these boilers two perpendicular pipes ascend into the principal ventilating conduits, and conduct the hot water directly into a special reservoir placed in the draught-chimney, appropriated to each apparatus. This reservoir is fed by six pipes, which traverse horizontally each range of cells, returning afterward, by the same passage, to the principal apparatus. Two pipes, filled with hot water, thus pass into all the cells. They are placed in a horizontal conduit running along the floor, close to the exterior wall. These conduits, covered with a plate of perforated iron, form for each cell a little reservoir of heat. Thus the caloric is utilized just where its action is required, since it is precisely in the cells that it disengages itself, supplying each with an equal quantity. Its center of radiation is in the cell itself. Let us examine now the mode of introducing fresh air. This introduction is twofold. In the first place, there is inserted in the window a ventilator of 30 centimeters (about 12 inches) in height and 44 centimeters (equal to 17½ inches) in breadth, through which the fresh air is introduced directly into the cell, without having come in contact with the heat-pipes. Secondly, at one of the extremities of the iron plate which covers the conduits from the hot-air furnace is left an opening, which allows the heat to circulate in the cells. The opposite side of the plate corresponds to an opening made in the thickness of the exterior wall, by which the pure air from outside penetrates into the reservoir, and so into the cells. A valve is fitted to this last opening, by which the prisoner can regulate the introduction of air, and by the same means can increase or diminish the heat of the cell. Let it be carefully noted that the reservoir of which we have just spoken, as well as the introduction of fresh air, is on a level with the floor. The vitiated air is drawn off by a conduit placed in the thickness of the wall on the opposite side from that on which air and heat enter. This conduit, at its upper extremity, leads into a great pipe, which runs horizontally under the roof, discharging its contents into a vertical chimney, at the bottom of which is situated the reservoir which receives the hot water of the furnace, whose smoke-pipe also traverses the chimney. This system of ventilation works naturally and without mechanism of any kind. An active ventilation incessantly purifies the different parts of the penitentiary establishment, throughout which there is always diffused a fresh and agreeable atmosphere. A cleanliness the most minute is continually maintained. The daily cleaning of the premises, the varnishing of the pavement of the cells by means of a special process, and the waxing of the floors and the pavements of the galleries have made it possible to give up washing with water, which is attended with great inconvenience. The walls of the cells, galleries, &c., are washed of a stone-color at the beginning of every year, and partially whenever it becomes necessary to remove spots or stains. No deposit of dirt or dung is allowed within the inclosure of the establishment, and all necessary measures are taken to have the rain-water speedily carried off from the premises. In summer, fumigations are made every morning. They are less necessary in winter, and are, consequently, less frequent during that season of the year.

To insure personal cleanliness on the part of the prisoners the hair is required to be kept short; whiskers, mustache, &c., are forbidden. The men are shaved twice each week. The prisoners are required to wash their feet once a week. Every two months in winter, and once a month in summer, they are required to take a full bath. The body linen is changed every week.

As regards the arrangement of the water-closets, two good systems are in use—movable vessels and fixed seats, with a pressure of water. The cells are lighted with gas; two stop-cocks are fitted to the lighting apparatus—one in the cell, under the control of the prisoner; the other on the outside, under the control of the keeper.

The use of the hammock has been given up, having been replaced in the cellular prisons by an iron table-bedstead. This bedstead is folded up during the day, contains the bedding, and serves as a table. The bedding consists of a mattress, a bolster, two cases for the mattress, two bolster-cases, two woolen blankets, and two pairs of sheets. The mattress and the bolster are made of sea-weed.

The infirmary occupies a part of the building at some distance from the cells, and the sick are distributed into spacious cells, well aired and comfortably warmed. These cells have a capacity of 40 cubic meters, and are provided with the necessary furniture and with clothing suited to the condition of the sick. The dietary is regulated according to a special tariff. The hygienic service leaves nothing to be desired. A cleanliness the most minute, a ventilation active and continual, frequent fumigations, the change of linen and of bedding—in a word, all desirable attentions are accorded to the sick. Independently of the assiduous attentions of which the sick are made the object, they are regularly visited, at least once an hour, and can, at any time, call upon the nurses by means of a signal, whose movement reaches to each bed. Prisoners seriously sick have watchers, and all the necessary measures are taken that they receive the attentions required by their situation.

The proportion of the sick for all the prisons of the kingdom is 2.74 per cent.; the average death-rate is 1.77 per cent.

§ 3. The food given to the prisoners in the penitentiaries of Denmark is healthy, clean, and sufficient, but plain. Dinner is the principal meal. The prisons are dry and airy, and in no private house is greater cleanliness found. During the last three years, the proportion of sick prisoners has been: Men, 2.11 per cent; women, 2.13. During the same period, the death-rate on the total average number of prisoners was: Men, 1.75; women, 1.79.

§ 4. The central administration of France attaches great importance to the hygiene of the prisons, and it takes special pains to free them from every cause of humidity. Even where the buildings which serve for imprisonment are not its own property, it reserves to itself an absolute right of control, as well as of preliminary approval, of all constructions and repairs appertaining to them. It has the power to insure, and it does insure effectively, that sanitary precautions are never neglected. Water is supplied in abundance, and, for the most part, of excellent quality. The ventilation of the prisons is made the object of a very special attention, and is effected by means of draught-chimneys, which cause the miasms to escape and facilitate the renewal of the air. To insure cleanliness in the prison buildings, the regulations prescribe that the floors of the several stories, especially for apartments in common, except the infirmary, be, as far as possible, covered with cement or stucco, in preference to flagging, tiles, or planks. The walls and ceilings are required to be carefully plastered and painted with oil, or

at least washed with lime. These precautions, whose aim is to facilitate the maintenance of cleanliness, are completed by official measures, whose daily or periodical exaction is placed in charge of the contractor of each establishment where the industries are managed by contract. These measures are specified in the contract. They consist principally in frequent and repeated sweepings, washings, and cleanings, as well as in fumigations and in the annual whitewashing of all the buildings.

The means of securing the personal cleanliness of the prisoners are of two kinds. The one, as the daily toilet, the bath, the washing of the feet, and the removal of the beard and long hair of the men, is applied directly to the individual. The other has for its object the linen and the clothing provided for the prisoners' use. They are both as extensive as possible, and are made the subject of numerous and detailed rules in the conditions of the contract and the regulations of the prisons. The position and structure of the water-closets are made a constant study of the administration, and improvements are gradually introduced wherever it is practicable. The prisons are generally lighted with oil, though in some cases with gas. They are commonly heated by stoves; some by hot-air furnaces; but these latter have not proved a great success. Iron bedsteads having been found preferable to all others, they are the only kind now purchased for the prisons of France. The old wooden bedsteads are fast disappearing, and will soon become a thing of the past. The complete bed of each able-bodied prisoner consists of an iron bedstead, a mattress or paillasse, (the former in all central prisons,) a bolster, two sheets, and one coverlet in summer and two in winter. The beds for the sick are larger and of better quality, and are provided each with a pillow and curtains. They have also both a mattress and a paillasse. As a general rule, twelve to thirteen hours are given to labor, (the number cannot exceed that exacted of free laborers;) two to two and one-half to meals and exercise in the open air; and nine to sleep. In the great prisons sick prisoners are treated in the establishment, whatever may be the nature or gravity of their disease. In the minor departmental establishments, the trivial cases are treated in the prison itself; the more serious ones, in the hospital of the place where they are situated. The sanitary system of the central prisons is organized in a manner the most complete. A physician, often resident in the establishment, is attached to each. The infirmaries are arranged in the best possible manner. A special dietary is accorded to the sick, agreeably to the prescriptions of the physician and the conditions of the contract. A dispensary, provided with all necessary medicines, is organized in each central prison, and an apothecary is charged with preparing the prescriptions. Affections of the digestive and respiratory organs and fevers furnish half—often two-thirds—of the inmates in the prison-hospitals. Imprisonment very generally produces a lack of blood, which favors the development or increases the gravity of certain diseases, such as consumption and scrofula. The average number of prisoners in the hospitals of the central prisons was, in 1868, 4 per cent. of men and 5 of women. The average death-rate in the same class of prisons in the same year was: Men 3.65 per cent.; women, 3.80.

§ 5. The five German states represented in the congress reply as follows:

(1) The prisons of Baden are represented as healthy, being commonly built on a dry soil; but they have no special system of sewerage. Water is furnished in sufficient quantity and of good quality. The ventilation is reported good. The cells and corridors are cleaned daily.

Scrupulous attention is everywhere given to cleanliness, insomuch that trades inconsistent with it are not practised. The prisoners have always a full supply of water in their cells. On entrance, each prisoner is washed in his whole person and has his hair cut. The daily ablution of hands and face is required, and every one must have twelve foot-baths and four baths of the entire person per year. They have clean linen weekly, and their outer garments and bed-clothes are washed as often as may be found necessary. They are shaved every week, and their hair is cut as often as needful. They must wash all vessels immediately after using them, and the floors of their cells are scrubbed at least once every week. The cells are lighted with gas. The prisons are heated in a variety of ways: by hot air, by steam, or by stoves of iron or earthenware. Each prisoner has a wooden or iron bedstead; a mattress, of straw, sedge, or varec; a bolster, of the latter substance; two sheets; and one or two counterpanes. The sick have, in addition, cushions, &c. The general distribution of time, without minute accuracy, is ten hours for work, nine and one-half for sleep, and the remaining four and one-half for meals, exercise, religious services, and school. The sick are cared for in special cells, or in common hospitals when their complaints are serious enough to require it. The most common diseases are those of the stomach, scrofula, and the maladies consequent thereupon. An average of (say) 5 per cent. of the prisoners are under the doctor's care, and the death-rate ranges from 1 to 2 per cent.

(2) Bavaria does not claim a good system of sewerage for all her prisons, but in those of recent construction great attention has been paid to this matter. The prisoners receive, three times a day, fresh water, generally of a good quality, for drinking and washing. The prison-rooms are, for the most part, well ventilated by windows. Other systems have not been found very successful. Work-rooms, sleeping-rooms, and corridors are swept daily, washed weekly, and painted yearly. Prisoners must wash the face and hands, clean the mouth, and comb the hair every morning; must take a foot-bath each week or fortnight, and a full bath several times in the year; and must be shaved once a week, and have their hair cut when necessary. Different kinds of water-closets are used. In the cellular prison at Nürnberg there are fixed closets made of cast-iron, which, by means of water-pipes, are cleaned three times every day; the bend or neck which connects the closet with the refuse-pipe remains always full of water, and thereby shuts off all sewer-gas. By means of the water all the matter is carried off, and falls into a reservoir at some distance, whence again the liquid part is drained off into a stream. This arrangement works well. In some other prisons, however, the arrangements are far from perfect, especially where during the night movable closets are put into the bed-rooms. Hot air, hot water, and stoves are the several modes of heating the prisons. The bed consists of: a bedstead of wood or iron, a straw mattress with a tick of unbleached coarse linen, a pillow of the same material, two sheets, a blanket of good sheep's wool, and in winter two. The most frequent forms of disease are those belonging to the respiratory and digestive organs. Four per cent. represents the average of the sick and 2 per cent. the average death-rate.

(3) In Prussia the greatest care is taken to secure a good system of sewerage for the prisons. Everywhere an abundance of water is supplied, and in the majority of prisons it is of good quality. All prisons built within the last forty years have been furnished with an effective system of artificial ventilation, which is generally connected with the heating-apparatus. The prisons are kept scrupulously clean, and, as far

as possible, free from vermin. As regards the means of securing the personal cleanliness of the prisoners, nothing is left to be desired. Besides daily ablutions, rigorously enforced, the upper part of the body and the feet must be washed every Sunday and the whole person at least once a month. Considerable variety shows itself in the water-closet arrangements. This part of the service does not appear to be in a perfectly satisfactory condition. The lighting of the prisons is by gas, petroleum, or oil; in the common dormitories lights are kept burning all night. The prisons of recent construction are heated by hot-water apparatus. The bedsteads are of wood or iron; the latter in all modern prisons. The bedding consists of a straw paillasse and pillow, sheets, and from one to three woolen counterpanes, according to the season, inclosed in a white or colored case of linen or calico. The infirmaries are supplied with hair-mattresses. The hours of labor are from 5 or 6 a. m. (according to the season) to 8 p. m., but subject to various interruptions for meals, rest, exercise, school, and catechising. The hours of sleep are from 8 p. m. to 5 or 6 a. m. Hospitals are found in all the prisons, and are fitted up with everything needed for the treatment of the sick in the best manner. Light cases are treated in the ordinary rooms. The diseases most common are pulmonary, intestinal, and other forms of consumption; renal, dropsical, cerebral, and spinal affections; and chronic ailments of the abdominal organs. Eight per cent. of the prisoners are usually under medical treatment—half in the hospitals and half in their cells or rooms. The death-rate is from 2 to 2½ per cent. on the average number of prisoners.

(4) In Saxony, from the combined results of science and experience, prisoners have received, since 1851, conformably to a regulation regarding meals, sufficient and nourishing food. This regulation provides for a daily variety suited to the season and the promotion of health. For dinners there are ninety, for breakfasts and suppers, twenty-eight, varieties of dishes. On principle, such food is given to the prisoner as is required for the preservation of his life, health, and strength for work. Requisite medical attention in every respect is given to the prisoners. The ventilation is arranged in a simple but effective manner. Drainage (in a technical sense) does not exist, but a system of sluices removes all the underground water. To cleanliness the most strict attention is paid, and it is rigorously insisted on in workshops, dormitories, water-closets, and clothing; there is also a regular use of baths. The daily average of cases of illness is from 1 to 2 per cent.; the annual average of cases of death is 1 to 3 per cent.

(5) The prisons of Würtemberg are provided with a good system of sewerage. Water, for drinking and other purposes, is found in all the prisons in sufficient quantity and of good quality. Prisoners are required to keep their persons, clothing, beds, workshops, dormitories, and all other places about the prisons scrupulously clean. Frequent bathing of the entire person is exacted. The food provided for the prisoners is of good quality and sufficient in quantity. The construction of the water-closets varies with the construction of the prisons; but even the ordinary ones are supplied with a ventilating apparatus for removing the bad air, and are carefully disinfected. Most of the prisons are lighted with gas. The bedsteads are of iron or wood. The bed consists of a straw mattress and bolster, two sheets, one blanket in summer, and two in winter. In reclusion-prisons the inmates whose health requires it may have their own beds, and in the prisons for preliminary detention there is no restriction in this regard. In prisons of reclusion the hours of work are eleven; of

sleep, nine. The remaining four hours are given to meals, recreation, schooling, &c. All the prisons have infirmaries, which are supplied with everything necessary for the sick; but prisoners who are only slightly indisposed are treated elsewhere. The diseased in mind are removed to a lunatic asylum. The average proportion of sick in the infirmaries for the last ten years has been from $3\frac{1}{2}$ to $4\frac{1}{2}$ per cent., and the death-rate from $1\frac{1}{2}$ to $2\frac{3}{4}$ per cent. The diseases are mostly the same as those which prevail among the free population.

§ 6. The allowance of food in the Italian prisons varies according to the class of the prison. In the detention-houses the ration is 1 bowl of soup and 750 grams ($1\frac{1}{4}$ pounds) of bread; in the penitentiaries, the same quantity of bread and two bowls of soup; in the bagnios, the same ration of bread and one bowl of soup, with the addition of a portion of meat once a fortnight. In the detention-prisons the prisoners are allowed to procure their own food if so disposed. In penal establishments worked by contract, and in the bagnios, the prisoners are allowed to use a portion of their *peculium* in increasing their diet, as they choose. In penitentiaries worked by the government the convict who accomplishes within a month a certain amount of work enjoys the next month what is called the "laborer's diet," and if he accomplish an extra quantity he enjoys what is named the "reward diet." The laborer's diet is a daily dish added to the ordinary ration. The reward diet adds to this an allowance of wine (*vin ordinaire*) three times a week. In the old prisons ventilation is provided for as best it may be. In the new constructions the best appliances of science are employed. The water-closets are made movable or fixed, according to the quantity of water necessary to prevent unhealthy effluvia. The average death-rate in 1870, as compared with the average prison-population, was: In the houses of detention, 2.97 per cent. of males and 1.77 per cent. of females; in the penitentiaries it was 5.09 per cent. of men and 3.41 per cent. of women; and in the bagnios, where only men are admitted, 2.78 per cent. The diseases most common in the bagnios are fevers and complaints of the lungs and nervous system; in the penitentiaries, diseases of the lungs and of the organs of sense.

§ 7. No information was furnished on this subject in the report from Mexico, further than the bare statement that it is unnecessary to warm the prisons of that country artificially, on account of the mildness of the climate.

§ 8. In some of the prisons of the Netherlands, the system of sewerage still remains imperfect, but reforms are sought to be everywhere introduced. The quantity of water supplied to the prisoners is without limit, and the quality is generally good, but in some localities it is difficult and expensive to procure it. Most of the prisons are well ventilated; where improvements are still needed, means are employed to accomplish them. Earnest endeavors are everywhere made to insure the cleanliness of the prisons, and for the most part with satisfactory results. The same is true as regards the personal cleanliness of the prisoners. As regards the system of water-closets, preference is generally given to inodorous, portable vessels, with a reservoir outside of the building. The prisons are commonly lighted by gas or petroleum. Lights are kept burning in the dormitories during the night. The system of heating varies in different prisons. In some it is effected by hot water or steam, in others by stoves. The prisoner's bed is made of straw; for the sick, of sea-grass or sea-weed. Hammocks were formerly in very general use, but by degrees they have been replaced by open bedsteads. The bed, complete, consists of a mattress and bolster, two sheets, one coverlet of a coarse

material, and one or two blankets, according to the temperature of the season.

There is no general rule regarding the distribution of time. The hours of labor (including those of school) are ten in summer and nine in winter, and, of sleep, eight and a half in summer and nine in winter. The remainder of the time is at the disposal of the prisoner for meals, rest, study, and reading.

A distinct part of the prison-building serves as an infirmary. In the cellular prisons, cells of double dimensions are appropriated to the sick. The medical service is confined to a military surgeon wherever there is a garrison; to a civil physician in localities where there is no garrison. The entire service is under the inspector-general of the medical service of the army, and is performed in a highly satisfactory manner. The most common diseases in the prisons, as outside, are diseases of the chest, especially phthisis. The average of the sick and of deaths it is not easy to give. It differs a good deal in different prisons, depending on local circumstances and the class or species of prison. The difference in the duration of punishments, which is by no means inconsiderable, exercises a great influence on the proportionate number of the sick and of deaths.

§ 9. A good system of drainage is reported for the Norwegian prisons. The water-supply is unlimited and of good quality. The ventilation of the prisons is reported good. Cleanliness, both of the prisons and prisoners, is enforced to the utmost practicable extent. The larger prisons are lighted with gas; the smaller with oil. In the penitentiary and most of the district-prisons the rooms are warmed by hot water; in the other district-prisons by stoves. In the penitentiary, hammocks are used; in the other penal establishments, wooden bed-frames; in the district-prisons, both sorts. The bedding consists of mattress, pillow, sheets, and blankets. The working-time cannot legally exceed fourteen hours in summer and ten in winter. The actual time employed in labor is less, varying from twelve and a half hours, as the maximum, to ten, as the minimum. The hours of sleep are not stated in the report. Every penal establishment has its own physician. In the district-prisons medical assistance is given by the official physician of the district.

§ 10. In the new prison-constructions of Russia, in spite of the difficulties offered by the climate, the greatest pains are taken to secure good and effective drainage. In the old prisons, everything connected with this subject is in a more or less barbarous state. The same thing is true as regards ventilation. The water-closets are generally primitive. Those used during the day are simply perforated planks above a pit more or less deep; for use by night there are portable vessels of wood. Efforts are now making to find a method which will unite economy, cleanliness, and pure air in a severe climate; but the problem is not easy of solution. The prisons are lighted almost everywhere by tallow candles. They are warmed, for the most part, by stoves. In exceptional prisons the system of Amossoff is employed. In this system tubes for conducting heat unite at a common subterranean furnace or fire-grate. Other systems have been also tried, but none has yet given a satisfactory solution of the difficulty as respects cheapness, climate, security, and other desirable advantages.

In most prisons the prisoners have no bed. They sleep on planks, ranged side by side, and fixed on stools about three feet from the floor. The bed, in prisons where it is found, is the same as everywhere else: a mattress and bolster filled with straw, linen sheets, and a coarse cloth blanket. The large prisons have hospitals in which the sick are treated,

and which are well kept. The more common diseases are scurvy and consumption. There is not a large proportion of sick prisoners. The same cannot be said of the number of deaths. This fact is explained by the kind of life that the prisoners lead before their imprisonment; they had been too much addicted to alcoholic stimulants.

§ 11. The situation and drainage of the prisons of Sweden leave little to be desired. It is quite common to build them on water-courses. The water for the prisoners' use is of good quality and the supply without stint. In the associated prisons there is no apparatus for ventilation; in those on the cellular plan it is otherwise. The strictest cleanliness is enforced. The prisoner, on his admission, has a bath and receives clean clothes. He changes his linen weekly and his sheets every fortnight. Frequent bathing is required, especially in summer. Water-closets are variously constructed, but they are not completely satisfactory. Gas is exceptionally used for lighting, oil and petroleum being commonly employed for that purpose. The larger cellular prisons are heated by hot water; the others, both cellular and associated, by open grates or stoves. The bedsteads are generally of iron in the associate prisons; in the cellular, hammocks are used. The bedding does not differ materially from that supplied in the prisons of other European countries. In winter the hours for sleep are from 8 p. m. to 6 a. m.; in summer from 9 p. m. to 5 a. m. Each morning and evening, half an hour is occupied in washing, in prayer, and in inspection by the officers. Half an hour is allowed for breakfast, the same for supper, and an hour for dinner. On Saturday work finishes at 4 o'clock. In winter those who labor in the open air work as long as it is light. The prisoners in cells walk for half an hour each day in the court of the prison. They work at most ten hours per day; the remainder of their time is spent in reading and receiving instruction.

In the cellular prisons the sick are commonly attended to in their cells; but they have a bed instead of the usual hammock. In serious cases, or in epidemics, the sick are transferred to a special room which is found in every cellular prison. In prisons on the associated system there are infirmaries with spacious and well-ventilated rooms, to which all prisoners are removed who, from sickness or wounds, are unable to work. No prisoner on the sick-list is allowed to remain in the work-rooms or in the common dormitories. The most common diseases are pulmonary consumption, affections of the stomach and intestines, especially among prisoners who work in the open air. During summer scurvy not unfrequently prevails. For five years the average of sick has been, in collective prisons, 4.4 per cent.; in cellular prisons, 4 per cent. In the same period the deaths were, in the collective prisons, 3 per cent.; in cellular prisons, 2 per cent.

§ 12. In the more recently constructed prisons of Switzerland and in those which have undergone extensive alterations, the sanitary appliances are such as the best experience and the best science suggest in regard to drainage, water-supply, ventilation, cleanliness, construction and arrangement of water-closets, heating, lighting, beds and bedding, hospital accommodation, &c. In the others, deficiencies are found in all these respects, varying from an approach to what humanity and sound policy demand to the absence of almost everything which these good guides point out as desirable.

§ 13. There is no general scale of prison dietaries in the United States, and from the diversities of climate and production there could scarcely be one; for what would be salutary at Boston might be otherwise at New Orleans or Charleston. In the Western States fresh meat is much

more freely used than on the sea-board; but in all our prisons meat is much more common than in those of Europe, being generally given twice a day in the state-prisons. Another frequent article of food is Indian meal, made from maize, and served up in the form of "mush," (which is a kind of pudding,) or of "brown bread." This is little used in Europe, and is not to be highly recommended as a common article of diet.

The ventilation and drainage of half the American prisons are reasonably good; of the other half indifferent or bad; in many instances very bad. Probably one-fourth of all the prisons, and a larger proportion of the state-prisons and houses of correction, are kept scrupulously clean; a great many, particularly among the county jails, are foul and filthy. Yet most of them are free from sickness, and the death-rate is not large. It cannot be given with any accuracy, however, for lack of careful statistics. In the cellular prison of Philadelphia, during a period of forty-two years, there were 353 deaths in a total number of 6,416 persons. As each person probably spent about three years in prison on an average, this would give a death-rate of 353 in 20,000, or 17.65 in a thousand, less than 2 per cent., which is not very great. Among an average number of 2,471 prisoners in Massachusetts in 1868, 44 died; in 1869 the average number was 3,043, and the deaths were 55; in 1870 these numbers were 2,971 and 58; in 1871, 3,145 and 68. In an aggregate average population of 11,630 this gives 19.35 for the annual death-rate per thousand in four years, which, all things considered, is less than in Pennsylvania.

§ 14. The sanitary arrangements and condition of the English convict-prisons are reported as good. No epidemic or other diseases prevail in these establishments. They are kept in a high state of cleanliness, and the medical officers are required to examine and report frequently on this point. The average death-rate for the last five years has been 1.37 per cent. for males and 1.45 for females.

In regard to the county and borough prisons the same report substantially was presented to the congress by the government inspectors.

§ 15. The sanitary arrangements in the Irish convict-prisons are reported as excellent, and the condition of the prisons in this regard as altogether satisfactory. The diseases most prevalent are colds and mild febrile and pulmonary affections.

CHAPTER VIII.

REFORMATORY RESULTS.

§ 1. Public punishment has two objects in Austria: the vindication of justice and the reformation of the criminal. The sad fact is acknowledged that the efforts for the moral improvement of prisoners have not been attended with good effect. No proofs exist that prisoners are made better by their punishment. The proportion of those who relapsed and were re-convicted during the years 1868-'70 was: Men, 59 per cent.; women, 54 per cent.

§ 2. The execution of punishment in Belgium has in view the double aim of expiation and reformation; the latter of these objects is steadily kept in view and earnestly sought by the administration. It is claimed to be in proof that in the cellular prisons the moral state of the prisoners is, in general, better at the time of their discharge than at that of

their entrance. Those who manifest evil inclinations are few in number; nearly all have sensibly modified the sentiments with which they were animated at the time of their commitment. Still it would seem that the good resolutions formed in prison yield, to a very great extent, to the temptations to which the liberated prisoners are afterward exposed in free life. Of the prisoners committed in 1872, 78 per cent. had been in prison before, and had fallen again after their discharge. The authors of the report made to the congress claim that this result cannot be charged to the cellular system, since nearly half the penitentiary establishments are still conducted on the congregate plan.

§ 3. The reformation of criminals is made a primary object of their treatment in Denmark, but though the convict generally leaves the prison with good intentions, yet his power of resistance often proves too weak to conquer temptation.

§ 4. The supreme aim of public punishment in France is deterrence, that is to say, the intimidation of criminals, and the repression of crime by that means. The moral regeneration of the convicts is considered as one of the means of action which the state can and ought to employ to diminish the danger of relapse, but not as the principal aim of the penitentiary system. In the case of prisoners sentenced to short terms of imprisonment it is difficult to obtain favorable reformatory results. On the contrary, the criminal so imprisoned is apt to become sensibly deteriorated. In support of this view, the report states that in France the proportion of relapses is in inverse ratio to the duration of the punishment. According to the last official report on criminal justice, of persons prosecuted for crime, those previously convicted formed $42\frac{1}{2}$ per cent., and of misdemeanants, $37\frac{1}{2}$ per cent.

§ 5. The states of the German Empire reporting show the following condition of things:

(1) Punishment is the primary aim of imprisonment in Baden, but it is intended to be so inflicted as to make it contribute to the reformation of the imprisoned. Those who leave the prison are generally better than when they entered it. The proportion of those who return to a criminal course after release is 20 per cent.

(2) In Bavaria, although reformation is looked upon as one great object of the prison system, the favorable results desired are not, upon the whole, obtained. The proportion of re-convictions is about 30 per cent.

(3) The principal aim in Prussian prisons is to satisfy justice, and to make the prisoners feel their punishment as an expiation of their crime. At the same time, all suitable means are employed to effect their moral reformation. Efforts are made to give them habits of order and work, and their minds are influenced by scholastic instruction, spiritual consolation, and moral precepts. Nevertheless, of prisoners sentenced to hard labor, the only class with respect to which reliable statistics exist, 60 to 70 per cent. in the whole kingdom are recidivists, that is, persons who, after their liberation, have again fallen into crime.

(4) In Saxony reformation is made one of the chief objects of imprisonment. The prisoners are in general better on leaving the prison than when they entered it. Their promises that they will live honestly are, in most cases, not mere empty phrases; and when some have failed in their purpose of amendment, the fault is mostly to be traced to existing general social evils. For successful warfare against these, liberated prisoners are wanting in energy.

(5) The primary object of imprisonment in Würtemberg is punishment; yet it is intended that the punishment shall be so administered as to effect the moral improvement of the prisoners. Of the inmates

of the prisons, more than a third—about 36 per cent.—are there on re-conviction.

§ 6. The administration of the Italian prisons finds it a difficult task to decide the question whether its penitentiary system answers the end of reforming the criminal, and whether on discharge the prisoner is morally better or worse. The relapses into crime scarcely exceed 18 per cent. on the whole body of criminals; but, in 1871, of the criminals sentenced to an imprisonment of more than a year, 28 per cent. were recidivists. Concerning the number of re-convictions, a most important fact may be gathered from the registered statistics of the administration relative to the time elapsing between the discharge and the committal of fresh crime. From these it is found that of recidivists sentenced to the bagnios, 27 per cent. relapse within the first year, 16 per cent. within the first two years, and 57 per cent. beyond that space of time. The re-convictions of those sentenced to the penitentiaries are 37 per cent. within the first year, 19 per cent. within two years, and 44 per cent. beyond that lapse of time; and among the females, 46 per cent. within the first year, 16 per cent. within two years, and 38 per cent. beyond that time.

§ 7. Deterrence has been considered in Mexico the primary aim of public punishment, though the moral reform of the criminal has not been lost sight of. So far, the prisoners leave their prison-house in a worse state morally than when they entered it; but it is believed that the changes recently made in the penal code will improve this state of things.

§ 8. The aim in the Netherlands is to make the punishment contribute, as far as possible, to the reformation of prisoners. The proportion of recidivists given by the (admitted) imperfect statistics of the country is, for the general mass of prisons, 25 per cent.; for the central (higher) prisons, 38 per cent.

§ 9. Protection of society by deterring from crime, that is, by intimidation, is regarded in Norway as the primary end of prisons and imprisonment; but the reformation of the prisoners is also considered a chief point. Of the inmates of the penitentiary, about 39 per cent. are there on re-conviction. With regard to other prisons, no information is given in the report. Whether the prisons have an improving or deteriorating effect upon their inmates is a question declared to be difficult to answer in a satisfactory manner.

§ 10. In Russia, the declared aim of all penal legislation is the reformation of the inmates of the prisons; but this aim is very far from having been attained. Indeed, the prisoners are admitted to be worse on their discharge than on their entry, since the liberated are a pest to the country. It is impossible to state the proportion of recommitments, for the want of statistics.

§ 11. The information furnished by Sweden on this subject is given in the words of the report, as follows:

The legislation, as well as the reform of prisons, initiated by King Oscar I, commenced in 1840. In consequence, thirty-eight new cellular prisons were built in all the provinces of the kingdom. They have all aimed at the moral reformation of the prisoners. But as all those who are sentenced to penal labor for more than two years are imprisoned in the large collective prisons with common dormitories for a large number of prisoners, and as they work altogether during the day for private contractors, their amendment has not been fully attained. On the other hand, the cellular prisons are regarded as not having corrupted the prisoners. Those who have been imprisoned only in cellular prisons have not been greatly hindered by their imprisonment from finding employment in the neighborhood of their home. During the last five years the number of recidivists has risen on the average to 28 per cent. But since Sweden suffered from scarcity of food in 1866, 1867, and 1868, and consequently it was difficult for men to find work, an extraordinary addition was made to the number of crimes against

property. Hence the percentage of recidivists, before mentioned, is considerably above the normal average.

§ 12. For Switzerland, the exact words of the report are also given:

The study of social questions, undertaken by numerous societies of public utility, and the reports presented in the meetings of the Swiss Society for the Reform of the Penal System and of Prison Discipline, have enlightened public opinion to such a degree that the legislative assemblies of most of the cantons are favorable to the propositions made with a view to the introduction of penitentiary reform into all our prisons. On the other hand, public opinion declares itself in favor of expenditures designed to improve the condition of criminals only after the state has supplied the country with hospitals, insane-asylums, orphan-houses, schools, &c., that is to say, with all needful establishments designed for the honest poor. In all the cantons where these institutions are found, the old theory of penal repression, based on vengeance, has given place to more humane ideas, the responsibility resting on society as regards the causes of crimes is better understood, and the system introduced into most of the prisons has for its aim the reformation of the prisoners. It is true that the penal codes of many of the cantons are based on punishment, intimidation, and expiation. But despite the text of the codes, which was often written prior to the reform of the prisons, it is sought in the penitentiaries to employ agencies which may combine at once repression and reformation. While in some cantons (those of the two inferior groups) the principle of repression is alone admitted, we see the canton of Zürich setting a good example by declaring, in its penal code, October, 1870, that the application of punishment ought positively to have for its object the reformation of the criminal. This principle, which, some day, will be applied in its whole length and breadth, dates only from yesterday. Hence we need not be surprised that the country is found in that transitional period when the principle of intimidation still struggles against the moral reform of criminals. The spirit of vengeance is not entirely extinguished; it still shows itself whenever any atrocious crime has just been committed. But the moment of indignation is transient, which shows that an immense progress has already been realized, and that its development proceeds without cessation, in spite of occasional reactionary movements.

The favorable results obtained in the moral reformation of prisoners subjected to the penitentiary *régime* of the modern establishments incite the others to a revision of their penal codes. No doubt there are many criminals and correctionals in whose case the influence of the improved penitentiary system does not make itself felt. As, among the insane, there are incurable patients, so persons in whom the moral sense has been completely perverted suffer themselves to be impressed in a penitentiary only by the evil which they find there, and show themselves insensible to the good which is sought to be accomplished. On the other hand, the greater number are far from being depraved, and the moral force of those who form this class increases in the prisons. At the moment of their liberation they feel themselves reconciled to society, and they have the firm intention of regaining, by their good conduct and by honest toil, the esteem of their fellow-citizens. But it is not easy for a prisoner to carry into effect his good resolutions. He has to confront many prejudices, to conquer many obstacles, and to resist many temptations, to which he would sometimes succumb if some charitable hand were not extended for his succor.

The proportional number of recidivists can be given only approximately. The statistics in the different cantons are not made out in a uniform manner. In some establishments, account is made of all private sentences—police, correctional, and criminal; in others, they embrace only those which have been pronounced within the canton or even notice only the punishments undergone in the same establishment. The greater part of the cantons expel from their territory liberated prisoners of foreign birth, and give themselves no further trouble about them; so that it may happen that the cantons whose penitentiaries contain numerous non-residents of the canton may have fewer recidivists to be registered. In spite of the defective state of the statistics, we may estimate an average of 30 to 45 per cent. as the proportion of recidivists in cantons where the penitentiary system has made least progress, and from 19 to 25 per cent. as that of the cantons whose penitentiaries are well organized.

§ 13. In very few of the prisons of the United States, taking those of all classes into account, is the reformation of criminals now made the primary object, and, as a matter of fact, numbers of prisoners leave the prison no better than they entered it. Many are made worse rather than better; and this is particularly the case in the county jails and with short sentenced prisoners in the district prisons. In our best prisons this is otherwise; but there are very few officers who can truly say that their prison discipline has reformed the convicts. Any statements made

regarding the proportion of re-convicted criminals in our prisons would only be misleading, owing to the very imperfect state of our penitentiary statistics.

§ 14. Little information is afforded on this subject in the reports submitted to the congress from England and Ireland.

CHAPTER IX.

PRISON OFFICERS—THEIR QUALIFICATIONS AND TRAINING.

§ 1. It is held by the authors of the report submitted on the part of Austria that; besides a technical knowledge of their calling, prison-officers should possess a good general education, and have experience of life, knowledge of human character, firmness, and a serious and humane spirit. The opinion is expressed that the greater number of the officers at present employed in the Austrian prisons are men of this character. Special training is not provided for this class of public servants. It is thought that the experience necessary for a prison officer may be best acquired by actual service in a prison.

§ 2. In Belgium it is held that the head of a penitentiary establishment should be thoroughly acquainted with everything relating to the moral, disciplinary, economic, and industrial administration. He has, so to speak, the charge of souls. He must be just, firm, intelligent, conciliatory; must know men, and especially criminals; and must possess, in a high degree, the attribute of probity. Above all, he must be animated by sentiments profoundly religious, for it is Christian devotion alone that can sustain him in the path of his duty and give him the force and steadfastness necessary to overcome the obstacles which will be sure to obstruct his progress. The keepers are moral agents; they must offer guarantees of morality, intelligence, zeal, and humanity. Their special service is of a nature to require that they be in the vigor of their age; that they have good health and a robust constitution; that they possess an energetic character; and that they have a good primary education, and, if possible, a knowledge of some one of the trades taught in the prison in which they serve. Special training-schools for the subordinate officers would be highly desirable, as they are apt to enter on their functions without the full preparation required by their mission. A school for keepers has existed for some years in the penitentiary of Louvain. The directors are recruited from the *personnel* of the administration, where, in passing through the successive grades, they have necessarily acquired the requisite knowledge. Special examinations are a condition precedent of their appointment.

§ 3. Prison officers in Denmark are appointed partly by the government, partly by the prison-inspector. Their appointment and discharge are totally independent of political and all other considerations not bearing directly on their qualifications and efficiency. There are no special training-schools for prison officers. It is thought that such would be too costly for a small country like Denmark.

§ 4. The management of penitentiary establishments, it is held in France, requires technical and administrative knowledge of great breadth, and offers, besides, special difficulties, arising out of the complicated organization of the service. It demands a profound knowledge of business, of ministerial regulations and details, and an unremitting application, a quality essentially requisite in all directors. The admin-

istrator who finds himself face to face with a contractor, whose interests are directly antagonistic to those of the state, ought to unite an unceasing watchfulness with an intelligent control. The principal duties of the administrator of penitentiary establishments—such as the organization of the prison labor, the examination of tariffs of labor, the maintenance of discipline in the midst of a perverted population, the choice and employment of means to awaken in the prisoners thoughts of repentance and ideas of moral renovation—all these duties, and others analogous, demand a special aptitude, fortified by an experience more or less extended. Penetrated with the idea that the direction of the penitentiary establishments cannot be confided, without the gravest risks, to agents who do not offer the most trustworthy guarantees, the superior administration has established rigid rules to guard against the bestowment of the elevated functions of the service upon agents whose aptitude and experience would leave the least room for doubt. In the same order of ideas, it exacts, in the case of all its agents, of whatever degree, the knowledge demanded by the positions which they are to fill, and makes their promotion dependent on conditions of time and experience, varying according to the importance of the trusts to which they aspire. In short, to keep out of the service of the prisons agents unable to offer the guarantees desired, a ministerial decree, under date of the 25th of March, 1867, instituted, in the ministry of the interior, a commission charged with the examination of candidates for employment in the active service of the central and departmental prisons. The programme of the required examination comprises the following points: Writing, grammar, arithmetic, the principles of accounts, history, and geography, (principally of France,) general notions of the penal system and of criminal procedure, general ideas of civil law, the civil and judicial administration, and the most important provisions of the laws, decrees, and ordinances relating to the penitentiary *régime*. The examination includes, in addition, a written composition. The result is, that the *personnel* of the prison service is composed, for the most part, of agents, enlightened, capable, and up to the height of the duties with which they are charged. Many of the higher officers unite to all the aptitudes required in the director of a penitentiary establishment a rare administrative ability and an extensive knowledge of criminality. In the lower ranks of the *personnel*, a majority of the agents are upright, zealous, and earnestly devoted to their duties.

There do not exist in France schools especially devoted to the education of prison officers. The best school in matters of this kind is thought to be that of practice and experience.

§ 5. The following summary is offered of the reports from the German states on this subject:

(1) In Baden, the qualities deemed necessary in a prison officer are: Integrity, devotion, energy, firmness, kindness, physical and moral courage, and a calm and brave spirit. These qualities are believed to be possessed by the superior and by most of the inferior officers.

Special schools for the education of prison officers have not been established, nor is their establishment recommended, because the work of prison officers can, it is thought, be best learned by practice.

(2) To be eligible to the directorship of a prison in Bavaria, the candidates must have studied the prescribed subjects in philosophy and jurisprudence, and passed the examination admitting them to act as judges. Candidates for the position of physician, chaplain, or teacher must have completed the studies connected with their several professions and undergone satisfactory examinations. Special schools do not

exist for the education and training of prison officers. Such schools, it is held, would be desirable, since much harm is done by ignorance in the treatment of prisoners.

(3) The report for Prussia holds that, besides personal integrity, sufficient general and special knowledge, directors and superior officers should be gifted with true and keen observation, a delicate discernment of individual character, and ability to read the secret thoughts of prisoners. They should also be energetic and strict, and yet kind and entirely impartial. Finally, they should possess some administrative capacity, and be, to a certain extent, familiar with the technical part of the trades, and have some knowledge of farming. As regards the subalterns, good directors will make them useful officers if they possess thorough honesty, imperturbable coolness, unshakable firmness mixed with gentleness, and a sufficient amount of intelligence and of moral and religious instruction.

No special training-schools exist. It is thought exceedingly desirable that such schools should be established for the education of the inferior officers, whose instruction, gained at a primary school, is seldom wide enough to enable them to perfect their knowledge afterward sufficiently to do anything beyond routine work.

(4) In Saxony the officers are appointed by the ministry of the interior. They are at first employed on trial, and are dismissed if found incompetent. Political influence does not enter into consideration. The qualification of the officers is on the average good. Separate schools for training officers do not exist. Most of the superior officers undergo, before their definitive appointment, a practical training in one of the penitentiaries. The higher the duties to be fulfilled become, and the more carefully the system of individual treatment is carried out, the more a knowledge of these duties approaches to science, the more necessary are the studies of pedagogy and psychology, and the more it becomes absolutely requisite to make special studies, in order to assist in attaining the highest efficiency in the administration. Just as no teacher can now be chosen, contrary to what was the case in times past, from men of another calling, but must be a man who has received a thorough education in his special branch, so the officers of prisons will be required to have special training, and, therefore, in future, special schools will become a necessity.

(5) In Würtemberg there are no special schools for the education of prison officers. The directors are usually men who have acted as magistrates, and have been formerly engaged in judicial duties, although ability to act as a judge is not indispensable for gaining the office of a director. The keepers are mostly non-commissioned officers who have left the army.

§ 6. Prison officers in Italy are proposed by the local authorities and confirmed by a ministerial decree. In making choice of them, no weight is given to their political opinions, but only to their probity and zeal. As prison officers require special gifts and knowledge, added to uprightness and intelligence, faithfully to fulfill their trust, the administration has for some time entertained the idea of establishing preparatory schools, and is studying the best plan for their regulation.

§ 7. The only item furnished on this head by the Mexican report is to the effect that schools for the special education of prison officers do not exist in the republic.

§ 8. In the Netherlands, it is deemed to be necessary that the directors and employés of prisons be men of tried morality, intelligent, and gifted with tact and with the knowledge necessary to inspire the respect

of the prisoners, even without the use of a severe discipline. This respect depends upon the spirit of justice, equity, and humanity which they exhibit in their relations with the prisoners. In the directors especially, there is needed a high degree of mental culture and an enlightened understanding of their duties; we might say, indeed, of their mission. A knowledge of the more important foreign languages is necessary, that they may be able to read and study the best writings on prison discipline and to communicate with the foreign prisoners. It is admitted in the report that the majority of the directors and employés of the prisons do not possess these talents and qualities, a fact which is due chiefly to the circumstance that the salaries are too low, and that the service of the prison officers is, in general, too onerous, and held in too little esteem. As a consequence, young men of good family and education refuse to enter upon this career.

There are no schools especially designed for the education of prison officers. The best school is thought to be a well-organized and well-governed prison, where are offered to the young employés the means of acquiring knowledge and developing their talents, by the reading and study of the best writings on the subject of prisons.

§ 9. The qualities deemed requisite in Norway in the higher prison functionaries are a good education, probity, firmness of character, and special aptitude for their work. The compensation at present paid to functionaries of the lower grade is so small that no great claims can be made upon them. Sobriety, punctuality, firmness in action, a mastery of the more common branches of learning, and the knowledge of some trade are the qualifications most valued. There are no special training schools for prison officers, nor, considering the actual circumstances of the country, are such likely to be soon established. No opinion is expressed in the report on the abstract question of their expediency.

§ 10. Integrity, humanity, punctuality, and intelligence are held in Russia to be the essential qualities of a good prison officer. The greater part of the actual employés are far from possessing these qualifications to the extent to be desired. The principal cause of this deficiency is the scanty recompense accorded them. There are no special schools for the education and training of prison officers. The author of the report, Count Sollohub, sees no urgent need of such establishments, since, in his view, the essential character of this class of officials is rather moral than pedagogic. The practical part, he thinks, can be acquired in some days. The count, however, thinks it desirable that there be established in the administration of prisons a system of gradual promotion, and thus of special service, in harmony with all the other branches of the public service.

§ 11. The qualifications deemed in Sweden essential to a good prison officer are a calm and even temper, a character humane and serious, a spirit austere and just, and the most exact order and punctuality in the performance of his duties. There are no special establishments for the instruction and education of this class of officers. The need of such institutions makes itself more and more felt by reason of the special knowledge and high moral tone required in these officers. The opinion is expressed that, while such special schools are wanting, persons desirous of entering the penitentiary service ought, prior to a full admission to that service, to be required to serve for some time in a well-conducted prison. Still, as even there they would acquire only the routine, and not the broad knowledge necessary for the due fulfillment of such functions as are required of them, it is recommended in the report that there be established a penitentiary normal school, that is, an institution for

the professional education of young men who aspire to employment in the penitentiary service.

§ 12. In Switzerland the greatest importance is attached to the choice of officers charged with the treatment of prisoners, since it is well understood that prisons badly administered, instead of being hospitals for moral diseases, become rather nurseries of criminals. Several of the more recently constructed and better-organized penitentiaries are presided over by men eminently qualified for their position, and they are aided by bands of intelligent employés, who contribute effectively to the mission which penitentiary education proposes to itself. Nevertheless, complaint is made, on all sides, of the difficulty experienced in finding, for the corps of subordinate employés, men possessing the requisite qualities and aptitudes. Schools designed for the special education of prison officers do not exist in Switzerland. It is generally felt that such schools would render an excellent service, especially if a just and sound idea should be given in them of the nature and aim of penitentiary treatment. A school of this kind would have the immense advantage of preparing officers who, at present, acquire their experience at the expense of the institution. Normal schools for the employés might, it is thought, be organized in penitentiary establishments selected for that purpose, in which candidates might pursue a theoretical course, and might also be practically initiated into all the branches of the service. In a well-organized and ably managed penitentiary novices who possess the necessary aptitudes become in a short time entirely competent to the discharge of their functions.

§ 13. The bane of prison administration in the United States is instability, resulting from the frequent change of officers, which is itself a consequence of the wide extent to which political influence enters as an element into their appointment. Some States have measurably escaped this influence, but they form rare exceptions to the general rule. But public opinion is becoming more enlightened on this subject; and, in proportion as it gains light and vigor, the tendency toward reform by the elimination of this malign power develops itself and becomes stronger day by day. Except as lowered through political influence, the average qualifications and efficiency of prison officers in America are as good as in other countries; but the lack of an effective system of control and inspection often makes our prisons less creditable to their officers than the real merit of the latter deserves. There are no special training schools for prison officers in the United States, but veteran and experienced superintendents, like General Pilsbury, Mr. Brockway, and a few others that might be named, do, in the course of time, train a considerable number of good officers. The clearest and most authoritative exposition of the state of public opinion among us as to the policy of such institutions is contained in the seventh resolution adopted by the National Penitentiary Congress of Cincinnati, in these words:

Special training, as well as high qualities of head and heart, is required to make a good prison or reformatory officer. Then only will the administration of public punishment become scientific, uniform, and successful, when it is raised to the dignity of a profession, and men are specially trained for it, as they are for other pursuits.

§ 14. In the reports relative to the prisons of England and Ireland, little information is communicated on this subject.

CHAPTER X.

SENTENCES.

§ 1. It is held in Austria that the frequent repetition of short sentences is rather injurious than beneficial. They blunt the feelings of the prisoner both as regards the punishment itself and the degradation connected with it, and their customary effect is to confirm him in criminality. By Austrian law, former conviction is looked upon as an aggravating circumstance, and the judge is obliged to give a severer sentence on re-conviction, even though the offense be of a different class. The disciplinary treatment of re-convicted persons is not, as a rule, made more severe than that to which those sentenced for a first offense are subjected.

§ 2. Recidivists are more severely punished in Belgium than persons committed for a first offense. Nothing is said in the Belgian report as to the good or bad effect of repeated short sentences, the reporters regarding this as a question peculiar to the criminal legislation and practice of the United States; a view of the matter which the undersigned, with all due respect, believes to be erroneous.

§ 3. The criminal courts of Denmark give short sentences for minor offenses. This increases the number of crimes, though not of criminals, the effect of the short sentences being that the so-called habitual criminals, more frequently now than before the present penal code was promulgated, both enter and quit the prisons.

§ 4. The authors of the report submitted from France appear to be somewhat perplexed as to the meaning of the expression "minor offenses," used in the question. But whether to be understood in the sense of those trivial violations of law called "contraventions" in the French criminal code, or in the sense of misdemeanors of no great gravity, both of which classes of offense are visited in France with but trifling penalties, it is confessed that these penalties do not prevent a repetition, nor, indeed, the frequent repetition, of the acts against which they are directed.

A relapse, which, in the legal sense, is the commission after a penal sentence of a new criminal act, receives little favor from the French law. The circumstance of a prior conviction, and the greater perversity shown by a repetition of the offense, seems, in effect, to demand from the legislator an increase of punishment. Doubtless, neither theft nor homicide changes its nature because committed a second time; but a crime has two elements, the substance of the act and the criminality of its author. The legislator has thought it a duty to take both these circumstances into consideration in measuring the punishment.

§ 5. (1) Of the German states, Baden answers that repeated short sentences for trivial offenses produce no good effect; and, therefore, the penal code of the empire visits recidivists with punishments of a longer duration.

(2) Bavaria returns a like response. Frequent punishments for minor offenses have no good influence; either the prisoners become embittered, or the punishments, on account of their frequency, lose their effect. More, it is believed, can be done in these cases by reproof and teaching than by punishment. Reconviction, especially for robbery, theft, and the concealment of stolen goods, is very heavily punished.

(3) Prussia replies in the same sense, both as regards the inefficiency of repeated short imprisonments and the necessity for increased severity of the punishment on reconviction.

(4) The answer of Saxony is in the following words:

The practice of courts of justice of passing sentences of short duration of imprisonment for slight offenses, and of repeating them in case of relapse, does not exist, because the penal law of the German Empire, even for theft a third time, orders imprisonment in a penitentiary, provided there are no extenuating circumstances. What effect this practice will have in regard to increase or decrease of crimes is yet problematical, and requires further satisfactory experience.

§ 6. Recidivists, in Italy, always receive severer punishment than offenders on first conviction. But the Italian criminal code does not regard as crimes the class of offenses known as "contraventions;" hence persons guilty of them are not accounted recidivists in the legal sense, and judicial statistics take no notice of such infractions of law, whatever the number of times they may have been committed by the same person. The whole question of sentences is considered so important, that the prison reform commission, recently created by royal decree, has thought fit to make it the subject of a special study.

§ 7. The commission which prepared the report to the congress for Mexico is of the opinion that evil consequences result from the fact that imprisonment is inflicted for slight offenses, even in the case of a first transgression, especially if the offender be sent to an establishment where prisoners are kept in association.

Reconviction receives the punishment which, the attenuating or aggravating circumstance of the case being considered, ought to be awarded to the offense itself, with an increase of one-sixth, if this is less than the former, of one-fourth if it is of the same gravity, and of one-third if it is greater. If the offender has been pardoned for a previous offense, and if it is not for the first time that he relapses into crime, the increase of punishment may be doubled.

§ 8. It is not thought in the Netherlands that repeated sentences to short imprisonments produce any good effect upon the prisoner. A relapse may give occasion to an increase of the punishment in the ratio of one-third, when the first sentence was for more than a year's imprisonment; and in all cases it is a circumstance which may determine the judge to award the maximum of punishment allowed by the law.

§ 9. Norway answers that experience has not certainly determined what effect repeated short sentences have upon the criminal. A prior conviction increases the punishment to be inflicted by a subsequent sentence; but as regards the treatment of prisoners during their incarceration, all receive the same.

§ 10. The report for Russia uses this strong language: "Not only do repeated short sentences produce no good effect, but they create criminals by profession."

A subsequent offense has the effect to increase the severity of the punishment.

§ 11. Short imprisonments for minor offenses are believed, in Sweden, to produce upon the prisoner an unfavorable rather than a favorable influence.

The punishment of thieves is gradually increased on each subsequent conviction. A fourth sentence may inflict ten years of hard labor, and in very grave cases the sentence may even be for life. But the national parliament has recently determined to lower the scale of punishment for recidivists convicted of theft.

§ 12. The directors of the Swiss penitentiaries are unanimous in regarding repeated short sentences for minor offenses as a pernicious judicial practice which is followed without reflection. The sentiment of justice, as well as the moral reformation of the prisoner, requires that the repression be more serious and more adequately protracted in

the case of individuals who take on the habit of crime, and who threaten to make it the basis of their character. The effect of these short imprisonments becomes worse on each successive conviction. The recidivists fall deeper and deeper, and the prison cannot lift them up. During the short stay they make in the penitentiary establishment, it is impossible to teach them a trade or even to make them apt at work. The recidivists sentenced correctionally have more or less lost the moral sense and self-respect. The influence of the penitentiary education cannot affect the individual of this class who, on entering the establishment, counts the exact number of days which separate him from freedom. Such prisoners undergo, more or less patiently, the restraint imposed upon them; they are indifferent, and little heed either the present or the future which awaits them.

The existing codes in the several cantons denounce a severer punishment against prisoners convicted more than once. Some sentence them to the maximum of the punishment incurred; others add to this punishment its moiety, and even more, in excess of the maximum. Every sentence for an offense exceeding six months becomes an aggravating circumstance in the case of the person who, having suffered it, is prosecuted criminally.

§ 13. It is the practice of courts in the United States to give short sentences for minor offenses, and to repeat them often in the case of the same person. The effect of this here, as everywhere else, is and must be to increase crime, as our prisons are now managed. Such is the unanimous opinion of all prison keepers, so far as known, in this country.

§ 14. The reports for England and Ireland are silent on this point.

CHAPTER XI.

IMPRISONMENT FOR DEBT.

§ 1. Imprisonment for debt was abolished in Austria by law May 4, 1868, and only a precautionary arrest can take place when the debtor, while the action is pending, is accused of an attempt to escape. Such an arrest is merely a deprivation of liberty, and the prisoner is allowed such advantages as are consistent with simple arrest.

§ 2. Debtors' prisons still exist in Belgium, but they are empty. Cases of incarceration for debt have become very rare since the publication of the law of the 27th of July, 1871. The treatment to which imprisoned debtors are subjected is not the same as that applied to criminals. They occupy special cells, have the exclusive enjoyment of an exercise-yard, and may communicate with each other, receive four visits a week from their relatives and from persons with whom they have business relations, and may correspond freely with the outside world.

§ 3. No information is afforded on this point in the report for Denmark.

§ 4. In France the law of the 22d of July, 1867, put an end to imprisonment for debt in commercial and civil matters and in those in which foreigners are concerned. The restraint of the body exists no longer, except in matters criminal, correctional, and of simple police. The usage has just been re-established as regards the payment of moneys due to the state. In such cases the public minister is bound to take care that persons imprisoned for debts to the state receive the same rations as the other prisoners who are in the charge of the administration.

The decree of bankruptcy may order the placing of the person of the bankrupt in a debtor-prison, and, if there is no such prison, in a part of the house of arrest reserved for that purpose. This is a measure which prudence almost always dictates. If the debtor is simply unfortunate, a safe conduct soon restores him to his family and to liberty; if the examination of his conduct justifies rigorous measures, it is thus made impossible for him to liberate himself by flight. The arrest and imprisonment of the bankrupt must be preceded by the consignment, on the part of the commissioners of bankruptcy, of the means of living, and, in case of insufficient means for this purpose, the advance of the moneys to be consigned is made from the public treasure, on the order of the commissioner, given at the request of the public ministry. The French law, as is thus seen, places the incarcerated bankrupt in a situation altogether different from that of ordinary prisoners.

§ 5. The German states report as follows:

(1) Imprisonment for debt does not exist in Baden.

(2) In the rare instances of imprisonment for debt in Bavaria, the treatment of such prisoners is milder than that of other prisoners. It is a mere arrest; they have almost unrestricted liberty as regards correspondence and the receiving of visits; their food is better; and they are separated from the other prisoners.

(3) In commercial and civil matters imprisonment for debt no longer exists in Prussia. It is, however, allowed when it becomes necessary to secure an examination or a judicial prosecution, or to execute a distress warrant. The treatment of prisoners for debt is totally different from that of criminals.

(4) No information on this point was furnished by Saxony.

(5) There is no imprisonment for debt in Würtemberg.

§ 6. Imprisonment for debt is still practised in Italy. In detention-prisons of any considerable size, there are commonly sections destined to the imprisonment of civil debtors. In none of them is there wanting at least an apartment for whomever is imprisoned on the demand of his creditor. The number of persons imprisoned for debt is exceedingly small. The maintenance of the debtor is a charge upon the creditor, and his treatment differs from that of other prisoners maintained at the charge of the state.

§ 7. Imprisonment for debt was abolished in Mexico as early as 1812, and has never been revived.

§ 8. This practice still prevails in the Netherlands. Persons imprisoned for debt are placed in the houses of detention and of arrest; sometimes in the cantonal prisons. They are entered on a special register, and are not confounded with other prisoners. In the greater part of the prisons the best apartments are assigned to them and a little better furniture. They do not wear the prison-dress, unless, indeed, they have no other; and their food is of a better quality.

§ 9. Imprisonment for debt still exists in Norway, but the right is seldom used. Its abolishment has been moved, and it cannot be long delayed. In the district-prisons rooms are arranged for receiving prisoners for debt, but they are furnished nearly in the same manner as common dwelling-rooms, and the constraint to which such prisoners are subject is only intended to secure their presence and to prevent infractions on prison discipline, while in other respects, especially as regards their meals and occupation, they are not ranged in the class of other prisoners.

§ 10. Debtors' prisons are still found in Russia in all their rigor; but a special commission has just formulated a project according to which

imprisonment for debt will be tolerated only in a limited number of cases. The treatment of persons thus imprisoned is, however, far less severe than that of other classes of prisoners.

§ 11. Since 1868 imprisonment for debt is permitted in Sweden only in cases where the debtor refuses to declare under oath that he is without resources. This class of prisoners is treated like those awaiting trial. They are not required to work, and have the right of procuring better food and more comforts.

§ 12. Prisons for debt exist only in a few cantons of Switzerland, and even where such prisons are still found, the constraint of the body has fallen into disuse. In a number of cantons, the state authorizes the restraint of the body, in default of payment of the expenses of justice; but this imprisonment is of short duration, and often is not inflicted at all. This punishment is regarded as correctional, and has no character of infamy.

§ 13. Imprisonment for debt has been abolished in most if not all the States of the American Union in all cases, except where fraud is known or suspected.

§ 14. No information was communicated on this subject from England or Ireland.

CHAPTER XII.

CAUSES OF CRIME.

§ 1. The report from Austria names, as chief causes of crime in that country, dislike to work, the desire for luxuries, impatience of restraint, want of education, and the poverty so closely allied to ignorance.

§ 2. The principal causes of crime in Belgium are stated to be, in the army, want of occupation and the system of substitution; in civil life, oblivion of religious and moral principles, ignorance of duty, want of a trade or some regular calling, artificial wants, drunkenness, libertinism, distaste for work, and consequent idleness.

§ 3. The crime most frequent in Denmark is the violation of the right of property. Three-fourths of the prisoners are sentenced for theft. The cause of stealing is rarely undeserved distress; most commonly it is idleness, the desire for lawful or unlawful pleasures, or habits of drinking. These vices generally result from, or are associated with, a neglected education.

§ 4. The report from the French government states that there is reason to believe that in France, as in many other countries, the insufficiency of moral education, the general defect of intellectual culture, and the want of an industrial calling, not opposing to the appetites and instincts a barrier sufficiently strong, leave an open road to crimes and misdemeanors. These offenses are afterward modified and perpetrated under influences springing from the circumstances by which their authors are habitually surrounded. It is thus that, on the frontiers, the populations, seeing in the code of fiscal laws only an enemy of natural right, have little hesitation, for the purpose of avoiding the payment of taxes, to sacrifice the lives of the agents charged with collecting them. In the cities, the laborer, seduced by ideas of a luxury which his labor does not and ought not to give him, suffers himself to be drawn on to attempts against property and, too often, against social order. The inhabitant of the country, who has under his eyes only the spectacle of a

productive soil parceled out to infinity by the law of inheritance, demands violently, sometimes even at the cost of his neighbor's life, the enlargement of the patch that belongs to himself.

To these evils, of which France has no monopoly, the report asks, Does there exist a remedy which will prove absolute and complete? It may be doubted; but it is certain that, in elevating morality, in fortifying the heart, in enlarging the boundaries of knowledge, the practical ability of men would be increased, and the effects of these evils would be diminished by lessening their causes.

§ 5. Germany answers thus:

(1) Baden says: "Thirst for pleasure," with a reference to 1 John, 2: 16.

(2) As principal causes of crime in Bavaria, are mentioned: 1. Want of religious teaching. 2. Abnormal family relations. According to a law that existed up to the year 1868, marriage between persons who possessed no landed property was exceedingly difficult, and, in consequence, illegitimate births were very numerous. As a result of the want of the beneficial influence which a family-life exercises, illegitimate-born form a considerable proportion of all prisoners. 3. Neglected education, especially in those parts where children are employed in the guarding of cattle or in working in manufactories. 4. Rough manners and customs. In some parts of Bavaria it is still a custom of the peasants to carry long stiletto-like knives when visiting public-houses and dancing-places; and thus, on Sundays and holidays, the slightest cause leads them to inflict on each other severe injuries.

§ 6. The inmates of Italian prisons, in 1871, were in the following proportions: For crimes against the person, in the bagnios, all males, 46 per cent.; in the penitentiaries, males 35 per cent.; females, 28 per cent. Crimes against property, in the bagnios, 30 per cent.; in the penitentiaries, males, 47 per cent.; females, 53 per cent. The chief causes of crime, accordingly, are stated to be cupidity, revenge, anger, and illicit passion.

§ 7. The answer returned by the Mexican government is so interesting, as well as able, that it is given, without condensation, in the words of the commission which prepared the report. The commissioners say:

Among the most general causes of crime in our country are want of education in the lower classes, abuse of intoxicating drinks, and poverty. Among the temporary and transitory causes which occasion the crimes and offenses committed in our country, the commission thinks that the most active are the following: The prolongation of civil war, the impressment to obtain soldiers, the bad state of our prisons, the commotion created in the religious faith of society by the innovations made in ecclesiastical matters, the want of preventive police, and the bad administration of justice.

Though all our statesmen and philanthropists have of late become aware of the importance and convenience to the public of the establishment of the penitentiary system, the financial difficulties, the little stability of our governments, and the constant necessity in which we have been placed to defend our existence against the attempts of revolutionary bands—an object which has almost exclusively absorbed our attention—have until now prevented the realization of this great social reform. Consequently, great criminals and petty offenders being indiscriminately mixed in our prisons, the contact, the association, and the example of the former have exercised a baneful influence on the latter; and, generally, those who, having offended against the law, are sent to our prisons and have remained some time in them, far from being reformed, leave the jail considerably worse than when they first passed under its gates. The improvement of our political state will also contribute to do away with, or at least to lessen, the bad effects of this cause; and the reform of our prisons, directed first of all to the total separation of prisoners, must be, according to public opinion, one of the first objects to which government ought to devote its attention, as soon as we have put into practice the principle that authority cannot be reformed by any other means than the pacific action of the laws, and that in consequence people are no longer exclusively preoccupied with the care of their own preservation.

§ 8. The chief causes of crime in the Netherlands are stated to be the want of education, drunkenness, and the desire to make a figure beyond one's means and position. In the case of young prisoners, there may be mentioned, in addition, the influence, often pernicious, of a second marriage of their parents, which not unfrequently, by embittering the position of the children of the first marriage, deprives them of the salutary influence of family-life.

§ 9. Crime in Norway, being for the most part a violation of the rights of property and assaults on the person, is traced mainly to laziness, drunkenness, bad company, neglected education, and the want of good home-influences.

§ 10. In answering this question for Russia, Count Sollohub says:

The cause of crimes in my country arises from a certain oriental fatalism, which enters profoundly into the character of the people. This fatalism, which is associated with a profound religious faith, inspires frequently a singular indifference to life and death, to the enjoyments and privations of life, sometimes even to moral good and evil. The result is a spirit of indolence, which, however, is often roused by the temptation to drunkenness and the excitements occasioned by it.

At the same time the count avers that the want of a general system of elementary education, abuses tolerated by a still defective administration, and a legislation which is not yet definitely settled, contribute in propagating lamentable disorders. He holds that, in the Russian penitentiary system, the cause of criminality must be kept in view, just as the cause of disease should not be ignored when the physician proceeds to treat his patient.

§ 11. The chief causes of crime in Sweden are the want of proper care in youth, bad company, evil examples, poverty, and the love of strong drink. An additional cause is that he who has once fallen into crime and been imprisoned for it is generally repelled and left without help in his efforts to gain an honest living. The re-admission of liberated prisoners into society is the more difficult, as by existing law every person who has been sentenced for theft, forgery, murder, &c., is further sentenced to loss of civil rights for a time (at least five years) or for life. This covers him with infamy, and consequently excludes him from all the rights and advantages pertaining to honorable men. His civil degradation is entered on his certificate of conduct.

§ 12. The question of the causes of crime is elaborately and ably treated in the report from Switzerland, a mere enumeration of which only can be given by the undersigned. These causes are said to be malign or defective education, abnormal family relations, sensualism, recklessness, drunkenness, and want of a trade or other regular business.

§ 13. The prevailing character of crime in the United States is hard to define. In the South and West crimes of violence, in the North and East crimes of fraud are common, and theft prevails very generally, though not so much as in Europe. Many of our most accomplished thieves and burglars come to us from the old country. Intemperance is a proximate cause of much the greater number of crimes here; orphanage, idleness, the want of family government, and the wretched home-life, or lack of home-life, in great cities, are leading causes of crime. A desire to live without work leads to much crime here, as well as in other countries.

§ 14. No information is furnished on this subject by the English or Irish reports.

CHAPTER XIII.

LIBERATED PRISONERS.

§ 1. The effort to procure work for liberated prisoners has, in Austria, been limited, hitherto, to this, that those who have learned a trade in prison receive a letter stating that they have done so, and those who have shown themselves particularly attentive receive a testimonial to that effect. In particular cases steps are taken on the part of the officials to procure work for those prisoners whose conduct has been exemplary and who have given proofs of firmness. The results, however, have been too isolated to afford any statistics upon the subject.

There is only one Liberated Prisoners' Aid Society, which is in Vienna. All efforts on the part of the prison directors to call into existence similar societies elsewhere have been unsuccessful. The society in Vienna limits its operation to supporting liberated prisoners till they shall have found occupation, and to aiding them with tools, clothes, &c.

§ 2. No prisoners' aid or patronage societies are found in Belgium; but the government has not lost sight of this important point. Efforts were made in 1848 to organize such associations; but, unhappily, the measures taken were not crowned with success. While waiting, the administration seeks the best means for assuring to liberated prisoners an effectual protection, so as to prevent their falling back into crime. A special credit figures even in the budget of the department of justice, permitting the administrative commissions of reformatory institutions to extend aid to their liberated inmates.

§ 3. In 1859 prisoners' aid associations were formed for each of the four great prisons of Denmark. Their action is limited to released prisoners. Each prison has thus its own society, founded by private liberality alone, which is to be considered as a charitable association; and it is thought to act best in that manner. The societies have annual general meetings, by which the administrations are elected. On the administrations there are always chosen some of the functionaries of the prisons, so that they may be put into direct relations therewith. As members of the administration, there are particularly selected citizens who carry on an extended business as manufacturers, merchants, artisans or agriculturists, and who have great influence, because they have it in their power to employ a large number of workmen. Once a month some member of each society appears in the prison to see the prisoners who are to be released the ensuing month. Their behavior is examined, and an agreement is made in regard to tendering the help that, according to circumstances, seems to be most fit. Not all prisoners are assisted, but mainly those who, on account of their diligence and good behavior, are recommended by the director. What, next to the behavior, is most taken into consideration is their age, their want, and their earlier life. The younger are especially helped by getting them into service; the older, by money; the artisan, by tools, &c. On the greater part the help is bestowed as a *gift*, but on some as a *loan*. Some are only promised help on condition that they first manifest their will to help themselves. All about, in the country, the society has its agents, to whom it confides its wards. These societies appear thus to be well organized. Every year they awaken a greater sympathy, and the number of their members increases. For ten years the state has given an annual subsidy; and the most cheering circumstance is that the municipal authorities, as well in the towns as in the country, more and more make annual

contributions, making it clear that the cause has been approved by the people. Several legacies have been left to the associations, the interest of which is to be expended in procuring clothes for released prisoners. The largest of these bequests is \$5,500.

§ 4. Up to the present time the patronage of liberated prisoners has not been generally or systematically organized in France. The Abbé Coural founded in 1842, near Montpellier, under the title of Solitude of Nazareth, a refuge designed for the liberated females of the south. The Sisters of Mary-Joseph, in imitation of this example, have founded seven other refuges near the central prisons, for women. There is only one establishment of this kind for men, the asylum of St. Léonard, at Couzon, (Rhône.) The results of the refuges devoted to women are good; those obtained at the asylum at St. Léonard are less satisfactory. Two active and successful patronage-societies, in aid of liberated Protestants of both sexes, have been for some years in existence. Since the official report was made to the congress, a central patronage society has been established in Paris, which proposes to found branches in all parts of France, as may be found practicable. The administration is earnestly engaged in seeking the means to increase the number of institutions similar to those mentioned above.

What is said above relates exclusively to adults discharged from prisons. The liberated juveniles of the department of the Seine are placed under the patronage of a society which facilitates their admission to provisional liberty and aids them in acquiring a trade. No better planned, efficient, or successful organization of the kind exists in any part of the world. It is but fair to the penitentiary administration of France to say that this last statement is not contained in their report; the responsibility for it is assumed by the undersigned.

§ 5. Germany responds as follows:

(1) In Baden, the directors of the penitentiary establishments are required to enter, for this purpose, into correspondence with the authorities of the political administration some time before the liberation of each prisoner; it is made the duty of these authorities to unite with the prisoners' aid societies and with the local authorities in providing for liberated prisoners. This measure is only of recent date, and its results have not yet shown themselves to any great extent. They cannot fail to be good.

Prisoners' aid societies exist in twenty-one out of fifty-nine districts. The results are satisfactory.

(2) To procure work for those liberated prisoners who are considered as improved, the administration in Bavaria puts itself into communication, while the prisoner is still under their care, with honest employers, with benevolent societies, with the parish vestries, or with other authorities. The prisoner receives on his dismissal, if necessary, clothes and traveling expenses from the funds of the prison. By these means prisoners are often preserved from relapse.

In every province of the country there exist liberated prisoners' aid societies; these are, however, hampered in their activity by ignorance, and the little interest which exists in the mind of the public, in many places, respecting their objects. But the Munich Society, which has existed for eleven years, has found employment for 1,182 discharged prisoners, of whom 377 have relapsed, while 805 conduct themselves well, and may be considered as reformed. The objects of these societies are to receive into a refuge those who are homeless, to try to procure them work, to give help—more especially in the shape of tools—and to watch carefully the conduct of each discharged prisoner.

(3) In Prussia, the administrative authorities of prisons use their best efforts to obtain protection and work for liberated prisoners. For this purpose they communicate with the minister and authorities of the birth-place or residence of the prisoner, and, wherever they exist, with prisoners' aid societies. Owing to the reluctance of masters and workmen to have relations with liberated prisoners, the efforts made to aid them have not been satisfactory in their results.

Aid societies exist in many towns, but they have neither a common organization nor a common center which unites them; and many more are wanted to make them bear any just proportion to the extent of country. Their number is too small and their action too feeble sufficiently to realize the objects they have in view. The aim of these societies is to give temporary shelter and work to liberated prisoners, either in asylums provided by the society or in the houses of private persons of honorable character. They seek in every possible way to maintain relations with their wards, in order to aid them with counsel or pecuniary gifts.

(4) Saxony communicates no information on this point.

(5) In Würtemberg there has been a patronage society for liberated prisoners, with branches in the different districts of the kingdom. It has 3,000 members. It seeks to aid its wards by obtaining work for them, and by supplying them with tools, raw material for manufacture, clothes, bedding, &c.

§ 6. In Italy certain religious associations possess funds that may be used in aid of liberated prisoners; an occasional patronage society exists in some of the cities. Such societies are what remain of institutions, more or less ancient, which were religiously preserved and even protected by the Italian government; but there are none of any great importance, except at Milan, Turin, and Florence. The government has sought to extend institutions of this kind; but down to the present time, such institutions are too few in number and too limited in means to justify a prediction as to whether they will take root in the social soil of Italy, and, if so, whether their rules should be preserved or modified in order that the best fruit for which they were founded may be obtained from them.

§ 7. The commissioners who prepared the report for Mexico state that as regards the federal district—the only part of the republic of which they have any positive information—committees of vigilance are being established, and to them, among others, belongs the duty of aiding discharged prisoners in finding work.

§ 8. The Netherlands government, as such, does not charge itself officially with the care of liberated convicts; but many directors of prisons take great pains to find work for them, and generally they have cause to congratulate themselves on the result of their efforts. The greater part of the directors, however, are reported as too indifferent to concern themselves much about the matter.

The Netherlands Society for the Moral Amelioration of Prisoners has for its object, not only the visiting of prisoners, but also the manifestation of an interest in their welfare after their discharge from prison. This society counts forty branches, scattered throughout the whole kingdom, and corresponding members in thirty-seven places where there are no branches. To some of the branch societies are attached committees of ladies. As regards the prisoners, a variety of methods is employed to encourage and help them. They procure situations for them at service, place them in the merchant-marine, supply them with tools, obtain for them some little industry or business, provide them with the means of emigrating, &c. The results differ, as a matter of course; but the

society accomplishes much, and often sees its efforts crowned with success.

§ 9. With a view of guarding released prisoners from relapse, efforts are made in Norway to procure work for them, to get positions for them as sailors, to aid them with tools, money, clothing, &c. At the same time, it is thought that too much assistance weakens their moral forces. There exist a few discharged prisoners' aid societies, but they lack the means to do their work as extensively and efficiently as would be desirable.

§ 10. Hitherto little has been done in Russia to aid discharged prisoners in obtaining work. The first patronage society has just been officially established in St. Petersburg.

§ 11. Prisoners' aid societies exist at present only in two provinces of Sweden. They aim at obtaining work for prisoners in the houses of steady masters; they also supply clothing, and sometimes make advances in money on the prisoner's work. Occasionally those expressing a desire have received aid to enable them to emigrate. Of late years it has been proposed to make greater efforts to give a more practical direction to the labors of these societies. They have started out on the principle that if habits of order and cleanliness are obtained by the discipline of the prison, and the time of imprisonment is properly employed in the moral education of the prisoners and in giving them skill in industrial and agricultural labor, the societies can more generally find them work immediately on their liberation. For prisoners for whom work is not at once obtained, it is proposed to establish agricultural colonies, where they may learn order in work and skill in certain branches of farming, so as thus afterward to be able more readily to earn an honest living.

§ 12. Patronage societies are organized in nearly all the cantons of Switzerland. That in the canton of St. Gall was established in 1839, thirty-four years ago. It was made by law the duty of every prisoner, who was a native of St. Gall, or had his domicile there, to place himself for three months at least under the protection of the society. Wherever patronage societies exist, they aid discharged prisoners by their counsels, watch over their conduct, shield them from evil enticements, and purchase the clothing, tools, &c., which may be needed by them. They endeavor to aid their beneficiaries by procuring work rather than by giving them assistance in money. But, in spite of all these efforts, the results do not correspond to the desires of the friends of prison reform. There is not sufficient unity in the organization of patronage. This is a great inconvenience, which the Swiss Society for Penitentiary Reform is seeking to remove, by bringing into mutual relation all those persons who, in the different cantons, occupy themselves with the patronage of liberated prisoners.

§ 13. The work of aiding liberated prisoners, and thus seeking to prevent their return to crime, is by no means as extensively or as thoroughly organized in the United States as it ought to be. Massachusetts has an official agency for this purpose, which has accomplished and is accomplishing an immense amount of good. The New York Prison Association, the Philadelphia Prison Society, the California Prison Commission, and the Maryland Prisoners' Aid Association are the four most efficient organizations of this kind in the country. There are a few minor organizations in different localities, more or less useful; but their work is, for the most part, restricted for the want of sufficient means to make it broader and more effective. It will be the work of the National Prison Association to organize such agencies in all the States where their organization may be found practicable.

§ 14. The patronage of liberated prisoners is more extensive, more thoroughly organized, more active, and more successful in England than, perhaps, in any other country. Some forty associations of this kind are found in the metropolis and the counties. They aid, annually, over 6,000 released prisoners. The assistance given differs according as it is granted to men or women. That accorded to men consists in procuring work for them and in furnishing them, while awaiting employment, board, clothing, &c. Two societies, however, have founded, each, a refuge for men. One of these deserves special mention. It has an average number of thirty-three men, occupied in making mats. It is the Industrial Home of Wakefield, in connection with the prison of that name. During a period of seven years this establishment has received 942 beneficiaries. The proceeds of their labor have sufficed to defray all expenses, and the men commonly earn a surplus of a few shillings each weekly. On the 30th of September, 1871, there was in the treasury between \$4,000 and \$5,000 of surplus earnings.

The assistance given to women is solely through the agency of refuges. It is, in fact, difficult to find immediate employment at domestic service for a woman just out of prison. She requires to be subjected to some preliminary probation. Discharged female prisoners themselves feel the necessity for this support which preserves them from fresh temptations. Hence they seek the interposition of aid societies in much larger proportions than men.

§ 15. Ireland has no patronage society for its convict-prison. The intermediate prison at Lusk, with its agent for discharged prisoners, does all that is necessary for men, and two refuges, one Catholic, the other Protestant, for women.

CHAPTER XIV.

SUGGESTIONS RELATING TO REFORMS.

The following was the closing question of the series addressed to governments, the replies to which have furnished the comprehensive and valuable information contained in the preceding chapters, viz: "Are you satisfied with the penitentiary system of your country? What defects, if any, do you find in it? What changes or modifications would you wish to see introduced?" The substance of the answers returned will be embodied in the present chapter.

§ 1. The answer of Austria is that the system of imprisonment as it exists in that country suffers from the fact that there is too great a uniformity in the punishment, and that there is not a prison for each kind of punishment. This, it is said, interferes with the effect of the various kinds of punishment, especially with those of a strict character. To remedy this it would be desirable, the report states: 1, to lessen the various kinds of punishment in number, and, if possible, to reduce them to three; 2, that every one of these punishments be characterized by differences in the dietary and treatment of the prisoner; and, 3, that every kind of punishment be undergone in prisons specially designed for it.

§ 2. Belgium replies that she is satisfied with her existing system, in so far as that reply is not applicable to establishments on the congregate plan, and that the transformation of these into cellular prisons is actively progressing.

§ 3. Under certain reserves the French report points out the following reforms and ameliorations as desirable in the penitentiary system: 1. The abolition of the punishment of imprisonment for offenses of little gravity, in place of which should be substituted, as far as possible, pecuniary penalties, the temporary privation of certain civil rights, &c. 2. The definitive choice of a system of imprisonment for prisoners awaiting examination or trial and for those sentenced to punishments of a duration not exceeding two years. 3. The adoption of a penitentiary system applicable, under different degrees of severity, to: 1, correctional convicts, sentenced to a punishment of two years and over; 2, reclusionaries; 3, persons sentenced to hard labor. 4. The organization of patronage societies, to which liberated prisoners may have recourse on their discharge from the penitentiaries.

§ 4. The German states represented in the congress give answer thus:

(1) Baden says that she is satisfied with her penitentiary system, since the cellular system, as a rule, is adopted.

(2) Bavaria replies that the system of associated imprisonment which exists in most of her prisons cannot be considered satisfactory, particularly as the greater part of them are old castles or convents, which are ill-adapted to purposes of imprisonment.

(3) The answer of Prussia is given in the words of the report, as follows:

In many respects the organization of Prussian prisons may be considered perfect. Order especially characterizes the administration. The assiduous care taken in regard to the prisoners in all respects and the efforts made to give them work suited to their capacities are beyond reproach. The discipline, severe, yet just, is excellent. The instruction and religious exhortations are efficiently and carefully given. On the other hand, our system has some grave defects which urgently demand the remedy we are earnestly striving to find. Part of the prisons require complete rebuilding; others need internal reconstruction; a general rule enforcing the separation of prisoners at night is urgently required, and their isolation, both by day and night, ought to be more extensively applied. We need the application of cellular imprisonment in all cases of preliminary detention and of short sentences. We think this system also indispensable for the objects aimed at in all penitentiary reclusion, and we consequently propose a proportional increase in the number of cells. We ought also to devise means for permitting the prisoners to work in the open air more than they do at present, and to effect this change in such a manner that the new measure may serve as a preparatory step for the prisoner's return to liberty. It is moreover very requisite to care more for the preliminary training of the inferior officers, to increase their number, and to give them facilities for passing, after a certain length of service in prisons, into other branches of the state-service. Lastly, to solve the difficulties which till now have obstructed effective prison-reform in our country, we must create a central organization which would regulate prisons of every kind and have due regard to the interest of every nature connected with prison administration.

§ 5. Norway replies in a very general way, with no definite proposition of interest to other nations, except that favoring the establishment of separate prisons for women.

§ 6. Holland says that the greatest defect in her penitentiary system is that there is no system, or, rather, that the two systems of associated and cellular imprisonment are applied without any uniform rule, and without placing them in a harmonious relation to each other. Hence there is a pretty general agreement that a reform is necessary, and that it should have mainly two objects in view: a revision of the penal laws, which would introduce a more uniform and more harmonious system of imprisonment, and a serious effort to give greater dignity to the position of the directors and employés, and to open these offices to men of a higher education. Whatever differences of opinion may exist as regards the system to be followed, (and they are great, since all the systems which divide *savans* find their partisans,) on these two points there is a very general agreement.

§ 7. Count Sollohub, replying for Russia, submitted a special and very able paper on this point, developing a complete penitentiary system, which he had drawn up and presented to the imperial government, as president of the commission on penitentiary reform for the empire. This paper, the production of a profound and, for the most part, right-thinking intellect, though long, is too valuable to be omitted. In submitting it to the congress, the count remarked that the brief view, presented by him, of the present state of the prison question in Russia sufficiently showed the urgent need of reform in his country. He said that the imperial commission, over which he has the honor to preside, had just completed the draught of a prison system, which was about to be revised by the proper authority, and he judged that it might have some interest for the eminent specialists then assembled in London. At all events, he desired the criticisms of his honorable colleagues in the congress, it being understood that the plan proposed is based chiefly on the circumstances and necessities of his native country.

The penitentiary system proposed by the imperial commission is, it will be seen, in the form of a bill or project of law, to be enacted by the supreme law-making power of the empire. It is in the words following, to wit:

I.—CLASSIFICATION OF THE PLACES OF IMPRISONMENT.

1. All the places of imprisonment in the empire are divided into: *a*, preliminary; *b*, penal.
2. The places of preliminary imprisonment are used for the incarceration of: *a*, persons awaiting examination or trial; *b*, persons convicted and awaiting the execution of their sentence; *c*, persons arrested by the police.
3. The places of penal imprisonment are used for the incarceration of persons sentenced by judgment of a court.
4. The places of preliminary imprisonment are subdivided into: *a*, police prisons; *b*, houses of justice.
5. The places of penal imprisonment are subdivided, according to the duration of the detentions, into: *a*, short duration; *b*, moderate duration; *c*, long duration.
6. The places of penal imprisonment of short duration are: *a*, jails (*les arrêts*);* *b*, houses of amendment.†
7. The places of penal detention of moderate duration are houses of correction.
8. The places of penal detention of long duration are convict-prisons, (*maisons de force*).‡
9. All prisons are divided, according to their localities, into: *a*, provincial; *b*, central.
10. The provincial prisons are: *a*, police prisons; *b*, houses of justice; *c*, jails; *d*, houses of amendment.
11. The central prisons are: *a*, houses of correction; *b*, convict-prisons.
12. The provincial prisons are considered, as regards revenue, unproductive.

* We have nothing in this country corresponding to the prisons here called *arrêts*. They seem to answer most nearly to our county jails, particularly in that function of these latter whereby they become places of punishment for persons convicted of trivial offenses. But the main function of our jails is to serve as prisons of preliminary detention. With this explanation, I translate the term *arrêts* by our word jail, as our language appears to afford no other.—E. C. W.

† This is another class of prisons for which we have no equivalent. Both the thing and its designation are wanting with us. The proper translation would be "houses of reformation," or "reformatory prisons;" but, as will be seen, the term of imprisonment in them is limited to three months and they are intended to act by *intimidation*, so that both the duration of the imprisonment and the predominant agency to be employed are against the idea of *reformation*, properly so called. The only thing I could do, therefore, was to transfer, without translating, the original word *amendment*, and leave the reader to interpret it for himself.—E. C. W.

‡ These correspond most nearly to our state-prisons and the English convict-prisons, being intended for prisoners guilty of the more heinous crimes. The expression by which they are designated, *maisons de force*, will be translated, in this version, *convict-prisons*.—E. C. W.

13. The central prisons are considered, as regards revenue, productive.
 14. Besides the prisons above mentioned, there shall be established in the empire refuges and penitentiary colonies for juvenile prisoners.

II.—ORGANIZATION OF THE PRISONS.

15. The reform and organization of the prisons of the empire shall be effected gradually, but all the kinds and gradations shall be established simultaneously in the different provinces.

16. Imprisonments made by the police take place, in the districts, near the communal administrations; in the cities, near the police-stations and their sections.

Observation.—The prisons may also serve for persons arrested by the administration.

17. Houses of justice for preliminary detention shall be established in the cities of the provinces and of the districts, and in other localities, if necessary.

18. Houses of justice shall be established, as far as possible, in connection with edifices devoted to judicial purposes.

19. Preliminary and penal prisons cannot be established in the same building.

20. Jails, (*les arrêts*), where punishment for light offenses (*contraventions*) is undergone, shall be established in all cities, and in other localities, if necessary.

21. Houses of amendment shall be established in all provincial and district cities where they are needed.

22. Houses of correction shall be established only in places where orders for the products of industrial labor are likely to be received.

23. Convict-prisons shall be established in the neighborhood of coal-beds, stone quarries, salt-pits, and other localities suited to the organization of toilsome and productive industries for long terms of imprisonment. The punishment of "hard labor" (*travaux forcés*) shall not be applied exclusively in countries outside the limits of European Russia, (Siberia.)

24. In the central prisons the establishment of hospitals is obligatory. In other prisons, hospital treatment is to be provided as far as possible.

25. Baths and, if possible, hospitals for the prisoners shall be established within the inclosure of the prisons, but separate from the main buildings.

26. The houses of justice and of amendment require two courts—one for the administration, the other for the prisoners.

27. A third court for the work-shops is required in the central prisons.

28. Stores of wood, sheds for tools and farming implements, the cellars, the stables, shall be placed outside the prison inclosure, in the court devoted to the general affairs of the establishment.

29. Near the houses of justice, the jails, and the houses of amendment there shall be arranged small gardens, in which the prisoners can take exercise.

30. Near the central prisons there shall be allotments of ground for cultivation: for houses of correction, not less than five acres per hundred prisoners; for convict prisons, not less than twenty-seven acres per hundred prisoners.

31. All the persons employed in the houses of justice, the houses of amendment, and the central prisons, except the head of the establishment and the overseer-in-chief, (male or female,) shall have their lodgings in the court devoted to the general affairs of the establishment.

32. There shall be a space of ground not less than twenty-three yards in width for a circular road around the central prisons. This principle is not obligatory for the other prisons.

III.—DISCIPLINE OF THE PRISONS.

A.—General regulations.

33. The discipline of all the prisons shall have for its base the three following principles: justice, guardianship, nationality.

34. The system of discipline of all the prisons shall have in view: 1. For prisoners awaiting trial—*a*, their complete separation, to prevent all connivance; *b*, the prevention of the association of prisoners charged with offenses of different degrees of guilt; *c*, the enjoyment of all privileges and comforts not inconsistent with the course of justice. 2. For prisoners under sentence—*a*, the just punishment of the crimes of which they have been judicially declared guilty; *b*, the exercise of a guardianship, which has in view the destiny of the convicts after their liberation.

From this last consideration arise the essential exigencies and special aims of the system: *a*, for jails, *admonition*; *b*, for houses of amendment, *intimidation*; *c*, for houses of correction, *punishment*, combined with a system of education, of industrial labor, and of preparation of the prisoners for a return to society; *d*, for convict-prisons, *chastisement*, with toilsome labor, having in view the ulterior colonization of the convicts.

35. Churches are obligatory in all central prisons. In other classes of prisons chapels only will be required. Images shall be placed in all the rooms appropriated to prisoners.

36. There shall be special regulations for each kind of imprisonment. These regulations will form a general code.

Observation.—There shall be given, in addition, by a competent authority, personal instructions to each head of a prison.

37. Every prisoner shall be placed in the kind of prison named in the sentence of the court.

38. The provincial prisons may receive into the same building the two sexes under the same administration, but the parts of the prison appropriated to each sex must be entirely separated from each other.

39. The central prisons, for each sex, must be separate and distinct establishments.

40. The system of association at night (and of beds on planks) is abolished. For the houses of justice and of amendment there shall be the system of complete separation between the prisoners; for the central prisons, the system of separation, by night, in common dormitories.*

41. In the prisons of preliminary detention, labor is not obligatory; it is obligatory in all other classes of prisons.

42. All changes in the distribution or placing of prisoners during the day shall be effected, in the penal prisons, by the ringing of a bell.

43. There shall be, in all penal prisons, modes of encouragement, consisting of privileges granted to the prisoners.

44. There shall be, in all detention-prisons, a system of disciplinary punishments. Corporal punishment shall be permitted only in convict-prisons. In all other prisons, there shall be allowed only incarceration, more or less rigorous.

45. The maximum duration of imprisonment is fixed: *a*, for jails, at three months; *b*, for houses of amendment, at one year and four months; *c*, for houses of correction, at one year to four years; *d*, for convict-prisons, from six years to life.

46. In the cellular houses of amendment, the duration of imprisonment shall be reduced by one-third.†

47. The mode of transferring prisoners will be made the object of a special regulation.

B.—Special regulations.

1. For police-imprisonments:

48. The detention-houses in the communes and police-districts have, for their end, only to provide for the safe-keeping of persons awaiting examination.

49. Every person who has given occasion to a judicial prosecution shall be kept in separate confinement, wherever it is possible.

50. Preliminary police-imprisonments shall be conformed to existing laws.

2. For imprisonments in houses of justice:

51. Wherever it is possible, conveyance to houses of justice shall take place in cellular carriages. In cases where the prisoners are taken on foot, they shall have the right to wear a hood on the head.

52. Individuals confined in houses of justice shall be placed at first in receiving-cells, from which they shall be taken, in rotation, to go through the formalities required by law, to be submitted to the inspection of the doctor, and to undergo the prescribed ablutions.

53. The prisoners have the right to keep their own clothing, unless it is worn out or too much soiled. In that case, they will be furnished with clothing by the establishment, but of different color and cut from that prescribed for convicts.

54. Photographs of prisoners shall be taken, if it is considered necessary.

55. Every article found on the prisoner, except his clothing, his shoes, and his linen, together with his baptismal cross and marriage-ring, shall be taken from him and kept in a place devoted to that purpose. A receipt shall be given to the prisoner for the money and effects placed in this repository.

56. The cell of the prisoner must be, in its dimensions, not less than fifteen square

* An apparent contradiction; but the arrangement seems to be this: The dormitories are to be common, with small apartments, or cells, arranged round their walls, by which the separation is effected.—E. C. W.

† Some members of the commission voted with the president, Count Sollohub, for a reduction of two-thirds.

archines,* and must contain at least three cubic *sagènes** of air. Special care must be given to the lighting and ventilation of the cell.

57. It is permitted to prisoners to have their beds, furniture, books, and writing-materials.

58. Prisoners who desire to work shall be encouraged therein. Three-fourths of their earnings, after deducting the cost of material, shall belong to the prisoner. The other fourth shall be deemed the revenue of the establishment, for the purchase of tools, materials, &c.

59. The prisoners shall have the legal rations of the prison and shall receive half a pound of meat per day; but they have the right to better diet, if they have the means of paying for it.

60. Prisoners have the right to smoke, but this privilege shall be withdrawn from those who use fire imprudently.

61. The prisoners shall have the right to take exercise, but their head must be covered with a hood, and they must walk five paces apart.

62. Interviews with relatives and visitors will be permitted only with the sanction of the counsel of the government, who will arrange the conditions of these interviews.

63. The chaplain of the prison is bound to visit each prisoner at least twice a week, and oftener if it is thought necessary.

64. The counsel of the prisoner shall have free admission to him at all times.

65. Persons sentenced by the court shall await the issue of their appeal, or the execution of their sentence, in the cells where they were previously confined, but they shall be deprived of all the privileges before accorded to them.

3. For jails:

66. Punishment in jails shall be undergone in virtue of the imperial decree of the 4th July, 1866.

4. For houses of amendment:

67. Sections 51, 52, and 62, relating to houses of justice, shall be applied to the houses of amendment.

68. The prisoners shall wear the prescribed dress.

69. The prisoners can neither smoke nor make use of their money.

70. The prisoners will be required to work eight hours a day at task-work. Two-thirds of their earnings will belong to the establishment; the remaining third shall be placed to the credit of the prisoner, but he will not be permitted to use it till after his liberation.

71. All prisoners shall have the same rations.

72. The dimensions of the cells shall not exceed fifteen square *archines*.

73. Interviews with persons from outside shall not exceed one per month. The visits of the chaplain, the doctor, the officers, and of members of philanthropic societies, are not subject to this regulation.

74. Prisoners shall be permitted to work over and above their task and beyond the hours prescribed. The amount of this additional work shall be placed to their credit.

75. Prisoners who shall have finished their terms shall be immediately liberated.

5. For houses of correction:

76. The term of imprisonment is from one year (minimum) to four years, (maximum,) without remission.

77. The prisoner confined in a house of correction shall undergo a preliminary cellular imprisonment, whose duration shall be fixed by the court. If this duration is not mentioned in the sentence, the prisoner shall be isolated only during the legal term. In both cases the administration has the right to reduce the period of complete isolation to the minimum fixed by the law.†

78. The system for houses of correction, in its rigor, shall be that of work in association by day and of separation by night.

79. Every person confined in a house of correction is bound to work ten hours a day without receiving any part of his earnings. This labor is employed in domestic service, laundry-work, and tillage. The product of this labor is applied to the support of the prison.

80. The duration of this labor may be reduced to four hours a day, if the prisoner expresses a desire to occupy himself during the other six hours in mechanical labors.

* An *archine* is a Russian measure of about two-thirds of a yard, and a *sagene* of about two yards and one-third.—E. C. W.

† This paragraph was strongly contested. Nevertheless, the opinion that a period of preliminary isolation is unnecessary did not obtain a majority of votes.

which require no special knowledge. This is called "mechanical work," (*travail mécanique*.) A third of his earnings when thus engaged goes to the workman; the other two-thirds are to the profit of the prison.

81. Those who do not desire to work ten hours a day at "rough" work, nor six hours at "mechanical" work, may learn any trade they prefer, which requires an effort of will and a sustained study. This is called "professional work," (*travail professionnel*.) Those who are learning a trade receive no benefit from their labor, and, in addition to eight hours given daily to their apprenticeship, must spend two hours on "rough" work.

82. As soon as a prisoner becomes master of a trade, he shall receive two-thirds of all he earns; the remaining third is applied to the profit of the prison.

83. Any prisoner who already knows a trade on his arrival at the house of correction shall receive one-half the earnings of his labor; the other half shall go to the profit of the establishment.

84. The foremen and apprentices of each trade constitute a distinct section.

85. The persons who supply constant orders to the sections are denominated curators (*curateurs*) of the sections.

Observation.—The director of the prison can have work done, in exceptional cases, conformably to the regulations mentioned above.

86. The rights and duties of the guardians (*tuteurs*) of the sections shall be regulated by law.

87. The curators of the sections shall settle weekly their accounts with the director of the prison in cash, and the sums due to the prisoners who have become master-workmen, for their labor, shall be inclosed in the portfolios of each section separately. These portfolios shall be kept in a special case, which is itself locked up in the strong box of the government.

88. The key of the case which contains the money of the prisoners shall be kept by the cashier, chosen by the sections. It shall be the duty of the cashier to be present at the weekly settlements between the curators of the sections and the sections themselves.

89. No prisoner may keep his own money, nor exact, under any pretext, what has been set to his account under the name of profit. He receives only a little book, in which is kept the account of the product of his labor for each week.

90. As an exceptional encouragement to industry and good conduct, one-fourth of their gains may be allowed to the sections for the purchase, through the agency of an inspector, of tea and any other authorized article.

91. Each section will choose a chief, who shall be responsible for the order of the section.

92. Each section shall be responsible for the escape of its foreman, and, in case of such escape, the said section shall forfeit its profits.

93. The monitor, the inspector of the prison, and the chief shall be responsible for the order of each section during the hours of work.

94. The movements of the prisoners will take place by couples, in military order, at the word of command and at the hours indicated.

95. A school shall be established in every house of correction.

96. The time spent in school shall be counted as time spent at "rough work," (*travail grossier*.)

97. On Sundays and holidays, after mass, the chaplain and the professors attached to the prison shall hold conferences with the prisoners; these conferences shall relate to religion, sacred history, geography, and scientific subjects.

98. During the night the prisoners shall be confined in separate cells, from which no one can go out without leave from the director of the prison. Silence is obligatory at night. The inspector is charged with the duty of supervision. The dormitories must be kept lighted.

99. Interviews with relatives and strangers shall be permitted at the times indicated by the regulations.

100. When the term of the imprisonment ends, there shall be given, from the cash-box, to those liberated, the money earned by them, after which no interview shall be permitted them, under any pretext, with their former comrades.

6. For convict-prisons:

101. Convict-prisons shall be established for the imprisonment of all persons convicted of felonies.

102. The convict, who shall have merited, by his industry and good conduct, an abbreviation of his imprisonment, may obtain it on the order of the administration of the prison, but not before he shall have undergone two-thirds of his punishment.

103. The prisoners who have not deserved an abbreviation of their sentences shall undergo in the convict-prison the entire punishment to which they shall have been sentenced.

104. Those prisoners who serve out their whole time are called *convicts*; those who have merited a shortening of their punishment receive the designation of *improved*.

105. In order to a transfer from the class of "convicts" to that of the "improved,"

the prisoner, in addition to good conduct, must have earned a sum determined by the regulation.

106. In case of ill-conduct and indolence, the "improved" prisoner is again placed in the class of "convicts."

107. The prisoner, on his admission to the convict-prison, shall be isolated from fifteen days to a month, according to the determination of the administration.

108. The families of prisoners are not admitted into the convict-prisons.

109. The convict-prisons are adapted to hard labor.

110. The work is subdivided into "hard labor" and "prison-work."

111. The "hard labor" is performed by the convicts in chains, which must be made according to the legal model; the "prison-work" is done without chains.

Observation.—The chains may be removed, even during the execution of "hard labor," by permission of the director, in testimony of his confidence. The chains shall be re-imposed on those who show themselves unworthy of this indulgence.

112. The convict-prisons should be established in localities which offer guarantees for hard labor, such labor constituting the punishment of the convicts. These guarantees are always necessary, and should be independent of accidents.

113. The convict-prisons shall be established only in localities affording ready communication, or offering facilities for the sale of the products of prison labor on the spot.

114. The industries for which the convict-prison is adapted may belong to the government, or to a company or private person, if the latter can offer the requisite guarantees.

115. The administration of the prison shall not interfere with the industries.

116. The convicts form only the motive-power of the industries.

Observation.—Payment of the laborers shall be made at the times fixed by the contract and in cash.

117. The places where the labor is performed shall not be more than $3\frac{1}{2}$ miles distant from the prison.

118. No convict can remain during the night outside of the prison inclosure.

119. The duration of hard labor shall be fixed at twelve hours per day in summer and ten in winter.

120. The administration of the prison reserves a certain number of prisoners to be employed, in rotation, in farm-labor, trades, and the domestic service of the prison, conformably to a special regulation.

121. Convict-labor may be of two categories: 1, obligatory, for a fixed number of hours per day; 2, voluntary.

122. The product of obligatory labor belongs to the establishment.

123. The product of voluntary labor forms a personal income, which is paid to the prisoner on his liberation.

124. The prisoners may not engage in voluntary labor till they have finished their daily task of "hard labor" or "prison-labor."

125. The director of the prison, in conjunction with the directors of the industries, shall determine the tasks to be performed by the convicts.

126. The tasks allotted shall be performed by order of the administration.

127. The administration of the prison must see that the prisoners do the full quantity of work assigned.

128. The prisoner may engage in voluntary labor on account of the director of the industries, or at some mechanical occupation, as he shall elect.

129. Prisoners under short sentences shall receive higher pay for voluntary labor than those sentenced to long terms.

130. During the hours of labor, the prisoners shall be superintended by the inspectors, and by the chiefs of sections, chosen by themselves. The work is to be performed under the direction of persons charged with that duty by the directors of the industries.

131. According to the nature of the work, the convicts may separate into sections, under pledge of abstaining from all disorder.

132. The regulations for sections in houses of correction may be adapted to convict-prisoners.

133. One-fourth of the personal earnings of the convicts may be used in aiding their families.

134. Between imprisonment in convict-prisons and the definitive establishment of the liberated prisoners in a country named by the government, the convicts will pass into a temporary establishment under the form of an agricultural penitentiary colony, where they may be prepared for their future abode.

135. The penitentiary colonies shall be established in districts selected and set apart to be definitively peopled by liberated convicts.

136. Criminals who have passed into the class of the "improved" shall be transferred to the penitentiary colony of the government, if they have earned the sum necessary to colonization. Those who have not earned the requisite sum must remain in prison till they have, without, however, passing the term fixed by their sentence.

137. The convicts sent into the penitentiary colonies of the government shall remain there till the date indicated by the sentence. Nevertheless, the term of the sentence may be reduced by the authority of the colony. Criminals who have undergone their entire sentence in the convict-prison must still pass one year in the colony of the government.

138. Labor is obligatory in the penitentiary colonies. It must be performed according to the orders and under the direction of the authorities of the colony.

139. Any person discharged from the penitentiary colony may choose, according to his liking, the place of his definitive abode, but not without the limits or the frontier of the same country.

140. Prisoners sent to the colonies may be followed by their families.

141. The laws and regulations for the colonies shall be fixed by special decree.

The principles relating to finance and to the mode of administration proposed by this *projet*, being based on local considerations, cannot, as a matter of course, be set forth in the present writing.

§ 8. The Swiss report limits itself to a short *résumé* of the reforms thought to be needed, as follows:

1. The unification of the penal code, based on the principle of the moral reformation of prisoners.

2. The reform of prisons for persons awaiting trial.

3. The increase of the number of reformatories for juvenile delinquents and vicious boys, and also the reform of work-houses and houses of correction for vagrants and idlers.

4. The erection of penitentiaries in cantons which have only the old-fashioned prisons, which are incapable of proper transformations. Two or more cantons, it is thought, might come to an agreement to establish a penitentiary in common, or they might make arrangements with a canton which already has one, or found other establishments to be used as intermediate prisons, agreeably to the progressive Crofton prison system.

5. The special education of prison officers and employés.

6. The reform of the disciplinary and educational *régime* of the penitentiaries, with a view to the moral regeneration of the prisoners.

7. The direction and supervision, not only of the administration of all the prisons, but also of preventive institutions, (such as public assistance, orphan-houses, agricultural colonies, refuges, patronage societies, &c.,) in the hands of special officers of the government.

8. The united action of the state and voluntary philanthropic societies and societies of public utility.

9. Finally, the perfecting of all institutions whose aim is the prevention of crime, whether in the domain of education, social condition, &c., or that of police and of justice.

§ 9. The tendency of thought in the United States on the question of prison reform is toward the Crofton system, which, in proportion as it is understood, is, year by year, gaining friends and adherents. No State has yet introduced it fully, or even its main features; but it can hardly be many years before this will be done. No doubt some injustice has been done in the United States to the cellular system, but the introduction of the Crofton plan may permit us to use the more desirable features of that system. The great evil in our minor prisons and in many of those of the higher grade is that there is no system at all, but a mixture of routine and caprice in the prison administration, from which good results can come only by hazard or by miracle. Particularly is this true in regard to female prisons, and in the whole United States there is scarcely a single good woman's prison. Considering the number and excellence of our reformatories for girls, this is the more astonishing. Efforts are making in several States to establish special prisons for women, which will no doubt prove successful in the end; and, in some, the day for this reform hastens.

CHAPTER XV.

JUVENILE REFORMATORIES.

Most of the sets of questions sent out did not, through a mischance in the office where they were printed, contain any interrogatory relating to juvenile reformatories. This fact will account for the small number of countries which furnished the congress with information on this most important branch of the work looking to the prevention of crime.

§ 1. In Denmark there are three educational establishments for neglected and misguided boys, with an aggregate of about one hundred and sixty inmates. Besides these, there is a society which undertakes to have children placed in families. The latter has worked with great success.

§ 2. Saxony has had, for above a generation, two reformatories for the education and reformation of children of both sexes, besides a house of correction for young persons aged from sixteen to twenty years.

The industrial occupation in these houses is agriculture, but mechanical occupation for the wants of the reformatory itself is not excluded. The admission of children takes place mostly at the request of their relations, of societies, or of police authorities, who are asked to contribute a small sum of money. Children up to twelve years, and young persons up to eighteen years of age, are placed under this reformatory treatment. According to age, school-instruction, occupation in the field and garden, and domestic work are the means of education. At the proper time, those promoted for good conduct are first sent into agricultural or domestic service, or apprenticed to tradesmen, under proper supervision, by the authorities of the reformatory. Conditional liberation must, as a rule, precede complete freedom. Well-disposed inmates of the reformatories, of the age of less than twelve years, are sent to board in carefully-chosen families, the reformatory paying for the board. Even these have to undergo a period of conditional liberation before attaining full freedom. The term of probation for children is at least two years; that of young people, one year. The results obtained in these reformatories, since 1856, have shown that such as were liberated after a probationary period, and who on account of relapse were sent again into the penitentiary, amounted to only 7 per cent. Reformatories and houses of safety, (asylums,) established and supported by societies or by associations, endeavor to reform neglected children by giving them domestic discipline and separate or public schooling. They mostly keep the children till they are fourteen years of age. Unmanageable children are sent for further education to the above-mentioned state reformatories. The number admitted into the state reformatories amounted, in the year 1871, to three hundred and forty-five children and to thirty-one young persons. The number of inmates in asylums, &c., during the year 1871, is estimated to be about two hundred.

§ 3. The establishments devoted to the correctional education of juvenile delinquents in France receive minors of sixteen years and under, of both sexes. They are divided, for young male prisoners, into penitentiary colonies and correctional colonies. In the first are placed: 1, children acquitted as having acted without knowledge, but who are not sent back to their parents; 2, young prisoners sentenced to an imprisonment of more than six months and not exceeding two years. These establishments are public or private: public when they have been founded by the state, and the state names and pays the directors and employés; and private when

they are founded and directed by private persons, with the authorization of the state. The correctional colonies receive: 1, young prisoners sentenced to an imprisonment of more than two years; 2, young prisoners from the penitentiary colonies who have been declared insubordinate. The correctional colonies are all public establishments.

A similar classification has been established for young female prisoners. They are received either in a correctional ward directed by the state, or into penitentiary houses connected with religious establishments. Of penitentiary and correctional colonies for boys, the number is thirty-two, three being public colonies, four correctional wards, and twenty-five private colonies. Of establishments devoted to young female prisoners, there are twenty, one of which is directed by the state; the rest are private.

§ 4. The number of reformatories in Italy is thirty-three, of which twenty-two are for boys and nine for girls. They are rather of an educative than punitive nature. They are entirely private in their character, having been instituted either by individual benevolence or by charitable associations. Government makes use of them for those juveniles who fall under the censure of police-law (*pubblica sicurezza*) for idleness or vagrancy; also, for the detention of those who are placed in them for correction by paternal authority. Of these establishments, twenty-five are industrial and six agricultural. Their discipline not being as severe as that in the houses of custody, government makes use of them also as a reward, gathering into them those minors who, having been overtaken by penal law, have shown an exemplary behavior.

The average number of juveniles sheltered in the reformatories in 1870 was 2,268, of whom 1,895 were boys and 373 girls. The total number on the 31st December, of the same year, was 2,465, of whom 2,066 were boys and 399 girls, thus classified: For idleness and vagrancy, boys, 1,931; girls, 399. Paternal discipline, boys, 135; girl, 0. Parents are under no obligation to provide for the maintenance of a child who is confined in a reformatory for idleness or vagrancy; but when a father places him in one of these establishments for correction, the state charges him with 36 cents per day. He is, however, exonerated in part or entirely from his charge, if he can prove himself indigent.

§ 5. The number of reformatory institutions in Switzerland destined to the treatment of juvenile delinquents is seventy, besides certain establishments founded by Messrs. Richter-Linder, Zellweger, and others, the number of which is not stated. Only four of these have been founded by the state; all the rest by charitable citizens, by societies of public utility, or by religious and philanthropic associations. The average number of inmates in these establishments in 1870 was 2,573, of whom 1,472 were boys and 1,101 girls.

§ 6. The first American reformatory, and still the largest one, was the New York House of Refuge, opened in 1825. It grew out of the efforts made by Edward Livingston and other enlightened philanthropists, to train the young in cities to a life of honest industry. In 1826, a similar reformatory was opened in Boston; and in 1828, another in Philadelphia. All these establishments received boys under sentence, and were supported, in whole or in part, by grants from the public revenue. They were not managed by the State directly, however, nor did they become a component part of the penal system of the State where they existed. The first step in this direction was taken by Massachusetts, in 1847, when the State Reform School at Westborough was established by law. Since 1847—that is, in the last twenty-five years—the policy thus initiated has been carried far forward, and is now adopted in more

than half the States of the Union. Reformatories, either wholly dependent on the States or materially aided by them, exist now in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Ohio, District of Columbia, Iowa, Illinois, Indiana, Minnesota, Michigan, Wisconsin, and California, while other semi-public reformatories, under municipal or private management, are found in these States, and in Missouri, Kentucky, Louisiana, &c., that is, in States containing an aggregate of at least 25,000,000 people. The number of large reformatories in these States must exceed forty, while the smaller establishments are still more numerous. The average number of reformatory pupils, in 1871, cannot have been less than 12,000, of whom more than 1,000 were girls; nor does this include the strictly educational or preventive establishments, like the State Primary School for poor children, at Monson, Massachusetts, the Boston Farm School, and many other such schools, in which it is probable there are as many more children, (say 12,000,) in all parts of the country.

The general results of these reformatory and preventive schools are good, as has been intimated. Of the estimated 12,000 in reformatories, strictly so termed, at least 60 per cent. will probably be trained into good citizens. Some would claim more than this, say 75 or 80 per cent., but there are no statistics that quite bear out this claim. Perhaps the percentage of worthy citizens trained up among the whole 24,000 in preventive and reformatory schools would be as high as 75.

In some of the States, parents *may* be held responsible for the support of their children in reformatories, at least in part, but this provision of law is seldom enforced. A large majority of the children are either orphans, abandoned children, or of such poor parents that little or nothing can be collected from them. In some of the private Catholic reformatories, it is understood that the payment of board by parents and kindred is strictly enforced, so far as practicable. There is, however, far less desire to throw children on the public for support, in this manner, in America than in England or France.

§ 7. An extended and very satisfactory paper on the reformatory system of Great Britain was furnished by Rev. Sydney Turner, inspector of reformatory and industrial schools. The substance of this paper, slightly modified, is given below.

The reformatory system of Great Britain was not created by the laws which now regulate its operation, but was itself the occasion and source of those laws. The condition of the younger classes of criminals engaged the attention of many persons interested in the social improvement of the community for many years before any changes were effected in the laws relating to them. It was not until the efforts of private zeal and benevolence had shown, by actual experiment, that reformatory schools could be established and worked successfully, that the legislature was induced to pass the acts which gave such schools their present recognized status, sanctioned their being largely supported by the government, and allowed magistrates to send children for detention in them.

About a century ago a charitable association, called the Philanthropic Society, founded a school for the reform of juvenile delinquents and for the protection and training of the destitute children of convicts, in the neighborhood of London. This was followed at a later period by two or three somewhat similar institutions in London and elsewhere, of which one, a small school at Stretton-on-Dunsmore, in Warwickshire, was remarkable as the first at which it was attempted to ingraft farm and out-door labor into the industrial training of the inmates.

In 1838, an act was passed for the establishment of a separate prison

for offenders under the age of sixteen, at Parkhurst, in the Isle of Wight. Land was attached to this for cultivation by the inmates, and the discipline was intended to be of a specially educational and reformatory character. By a clause in this act, the Queen was empowered to grant pardons to such young offenders as might be desirous of an opportunity of reformation, *on condition* of their entering some benevolent institution of the reformatory class, remaining in it, and being subject to its regulations till duly discharged therefrom. Under this clause a considerable number of young offenders under sentence of transportation or imprisonment were received into such reformatory institutions as then existed.

In 1847, the attention of the managers of the Philanthropic Society was drawn to the remarkable effort of Monsieur Demetz and others in France, for the establishment of an agricultural reformatory, without walls or sentries, for French juvenile delinquents, at Mettray, near Tours. Being then the superintendent or director of the Philanthropic Institution, Mr. Turner visited Mettray, reported on its arrangements and system of management, and induced the directors and supporters of the society to attempt a similar experiment in England. The Philanthropic Farm School at Redhill, Surrey, which Mr. Turner thus established and organized, and which he directed until appointed, in 1857, to the office of inspector of reformatories, was the fruit of this movement. It was followed by smaller schools on similar principles of domestic management—absence of walls and warders and the use of out-door employment—founded by Mr. Barwick Baker, at Hardwicke, in Gloucestershire; Mr. Adderley and Mr. Joseph Sturge, near Birmingham; Mr. Compton, in Hampshire; and Miss Carpenter, at Bristol.

The additional impulse thus given to the public interest in the question “how juvenile delinquency should be dealt with” led to the assembling of a conference at Birmingham of those most interested in the subject in 1853, and the results of this were the reformatory schools act for Great Britain and the industrial schools act for Scotland of 1854.

Under the first of these, which was brought in by Mr. (now the Right Honorable Sir Charles) Adderley, the secretary of state was empowered to license reformatory schools approved by him and to make an allowance for the maintenance of the young offenders committed for detention in them. Powers were given to courts of assize and quarter sessions, and to two magistrates acting in petty sessions, or to any stipendiary magistrate, acting alone, to commit young offenders, under sixteen years of age, to such schools for any term of detention, not less than two nor more than five years. The managers of the schools were invested with the necessary powers of control, and the inspection and general supervision of the schools by the secretary of the home department were provided for.

Under the second act, introduced by the late Mr. Dunlop, destitute and vagrant children, under fourteen years old, in Scotland, were similarly provided for in industrial and ragged schools. Such schools were partly under the supervision of the committee of education of the privy council and received what government aid they had from the education-grant.

In the same year, 1854, a special act was obtained by the magistrates of the county of Middlesex, enabling them to erect an industrial school for that county, (including the greater part of London,) to which young offenders under fourteen years of age might be committed for three years’ detention. The school erected under this act has since been certified under the general act of 1866.

A most valuable provision in both the acts allows of the inmates of the schools being placed out on probation before the expiration of their sentence of detention under a license from the managers of the school, liable to be revoked for misconduct.

The prison authorities of counties and boroughs are empowered to contribute to the schools by grants from the county or borough rates. Such grants in 1870 exceeded £40,000. The schools are in general more or less aided also by voluntary contributions.

The results of both the reformatory and the industrial schools have been very encouraging. In many schools of either class 80 per cent. and upward of the inmates have turned out well after their discharge, and the general average for all has reached nearly 70. These results are taken from the returns which the managers of each school have to make for the three years succeeding each inmate's discharge of his or her character and circumstances. They would certainly be still more favorable if there were more effectual powers in the acts for restraining the after-interference of the child's friends and relatives.

The results of the operations of the reformatory and industrial schools must not, however, be judged of only by the proportion of those received into them who turn out afterward honest and industrious, reformed from the criminal habits or weaned from the vagrant disorderly dispositions with which they were growing up to be dangerous in themselves and instruments for corrupting others.

The results are seen still more decisively in the diminution of the numbers of the younger classes of criminals and the lighter character of the crimes with which our juvenile offenders are now more commonly convicted.

In the year 1856, when the reformatory school system began to be in more active operation, the number of juvenile offenders (*i. e.*, boys and girls under sixteen years old) committed to prison (for the twelve months ended September 29) was 13,981; in 1858, when the system had spread and taken root, the number sank to 7,622; and in 1870, in spite of the very large increase of our population, and especially of the population of our larger towns, from which juvenile crime draws its most numerous recruits, the number of young offenders committed was but 9,998, the number of adult commitments having advanced from 99,755, in 1856, to 147,225, in 1870—an increase of above 50 per cent.

There is no doubt that the reformatory school system, laying hold on and placing under long corrective discipline and training the boys and girls who had become familiar with crime and adepts in its practice, not only in a majority of cases reformed the individual, but broke up those *schools* of crime and vice which were becoming so formidable. The change in the type or character of the young offenders themselves, who are laid hold of by the system, is as remarkable as the falling off in their numbers. The clever, experienced pickpocket, with his five or six satellites or apprentices, convicted, perhaps, six or seven times, and laughing at the offers of repentance and the opportunities of honest life offered to him, has disappeared. The inmates of the reformatories are now chiefly untrained or ill-trained children, with little criminal science, and generally much more dull and indolent than sharp or active, the products of neglected education and loose home discipline rather than of criminal training or of special criminal disposition.

The results of the industrial schools so far tend in the same direction, the extinction, that is, of the vagabond and half-thievish class they were originally designed to deal with, and the substitution in its stead of merely poor and neglected children, a large proportion of whom might

be effectually cared for by a good system of day-feeding schools—schools in which they might be kept throughout the day, so as to be taken out of the streets, and the oversight and training supplied which the circumstances and employments of their parents prevent them from receiving at home.

The whole number of young offenders committed to reformatory schools since the passing of the first reformatory schools act in 1854 amounted at the end of 1870 to 21,991 in Great Britain, and, of children sent to industrial schools, to 14,451.

The reformatory schools act was amended by successive statutes in 1855 and 1856, and an industrial schools act was passed for England in 1857 and amended and enlarged in 1861. By this last act industrial schools for both England and Scotland were placed under the home office, and an allowance for the maintenance of the inmates from the treasury, similar to that given to reformatory schools, provided for. In 1866 the reformatory and industrial schools acts, now in force, were passed, and the system now in operation finally sanctioned and defined, similar but separate statutes being enacted for Ireland in 1858 and 1868.

Under these acts, the number of reformatory schools in Great Britain had increased by December 31, 1870, to 64, containing 5,433 actual inmates, and that of industrial schools to 91, containing 8,280 inmates. Adding to those the numbers who were out on license or absent by desertion, &c., the total number of young offenders under sentence of detention in reformatories was 6,562, and of children sent to industrial schools was 8,788.

The distinction between reformatory and industrial schools is that the first are more directly for correction and the second for prevention. No boy or girl can be committed to a reformatory school unless convicted of some positive offense, punishable by imprisonment or penal servitude, and sent in the first instance for not less than ten days to jail. They must be under sixteen years of age and above ten years, unless previously convicted or sentenced at a superior court.

On the other hand, the industrial school is for destitute and vagrant children, found begging or wandering, without home or visible means of subsistence or proper guardianship. Such children must be under fourteen years old, and they are sent direct to the school, and do not pass through the jail. Children uncontrollable by their parents can be sent to them on their parents' application, but for such children the treasury allowance is limited to two shillings per week. Children under twelve years old, who are guilty of any petty offense, can be also sent to them, instead of being committed to prison and a reformatory, at the magistrate's discretion.

The allowance from the treasury for inmates of reformatories is six shillings per week; for inmates of industrial schools above ten years old, five shillings; under ten years, three shillings. For the year 1870 the total amount of the treasury payments was £177,384, the total expenditure of the schools being £311,794.

The fundamental principles on which the reformatory system is based are thus stated by Mr. Turner:

1. *The union of private and benevolent agency with government supervision and support.*

All the reformatory schools, and, with two exceptions, all the industrial schools now in operation, have been established and were at first materially supported by voluntary contributions. Many of them still derive a portion of their income from private sources, and all are man-

aged by committees or individuals appointed by the subscribers and contributors by whom they were founded.

The government interferes as little as possible with the ordinary superintendence, prescribing certain regulations as to the lodging, clothing, and feeding of the inmates of the schools, and as to the instruction they receive and the discipline they are subjected to; but leaving all the details of the management, the appointment of the officers, the admission of inmates, the expenditure, &c., to the committee. The state may be said to contract on certain terms with the several institutions for the work which it wants done, and so long as the work is fairly performed it exercises no further interference.

Important advantages accrue from this arrangement. A far greater degree of freedom and elasticity is secured to the working of the system; much of the merely mechanical routine which is inseparable from government establishments is dispensed with; the schools are more thoroughly adapted to the different localities they are planted in; a greater variety of moral and social influences is brought to bear upon their inmates; religious interest and zeal, without which little impression can be hoped for, are enlisted; and *economy* in the *expenditure* and *efficiency* in the *industrial training* of the schools are more thoroughly insured. Two advantages, not otherwise attainable, are especially secured: the one, the freedom of the religious teaching of the inmates; the other, their disposal in the world when discharged from the schools.

If the state founded and administered the schools, what is called the religious difficulty would be met with at the very outset, and each differing section of the religious community would be struggling for the assertion of its own peculiar views and practices, or protesting against those of others. But all this is avoided by the employment of the voluntary system under government supervision and through government aid.

Reformatory or industrial schools may be established in connection with any of our different religious bodies, and, in point of fact, we have schools founded and managed by Presbyterians, Roman Catholics, and members of the Society of Friends. But the law secures the religious rights and liberties of the children by enacting that, if the managers of any school receive a child of a different religious denomination from that of the school, they shall allow a minister of the child's denomination to attend and instruct it, and the rules, which are sanctioned by the secretary of state, prescribe that such a child shall not be required to learn the catechism or to be instructed in the doctrines of any other persuasion than its own. The same rules provide generally that the children in the school shall receive daily religious instruction agreeably to the denomination of the school, and shall have regular opportunities of worship on the Sunday.

The other advantage following the mingling of public and private agency in the reformatory system is the better and easier disposal of the inmates on their discharge. If the schools were administered by the state, it is believed that they must inevitably take more or less of the form and complexion of prisons, and the boys and girls discharged from them would be looked on with the same sort of distrust and suspicion that attach to discharged convicts.

2. *A second essential principle of the English reformatory system is the use of moral in preference to physical discipline.*

The institutions are organized and carried on essentially as *schools*, not houses of confinement or correction, the greatest degree of personal liberty and freedom of action being allowed that is compatible with real personal supervision and the exaction of prompt and strict

obedience. Most of the reformatories are founded on the plan of farm-schools, with agricultural labor as the chief employment. There are no walls, no warders, no sentries. The men who have charge of the working parties usually work with the boys, guiding and instructing them in their labor, while they overlook them and report on them as to their conduct. The boys are taught to hold themselves responsible, and to regulate their own conduct as far as possible by a system of rewards (or marks) for labor and improvement, and fines for misconduct and idleness, which they are fully acquainted with, and by acting on which they can increase the comforts of their position, avoid punishment, and effectively advance their final liberation. Every inmate of a reformatory or industrial school is allowed free communication with his relatives, and, if they are of tolerably good character, is allowed from time to time to visit them. The cases in which this privilege has been abused and advantage taken of the leave to abscond from the school have been and are very rare indeed.

3. *It is an essential characteristic of the reformatory system that the schools have a thoroughly religious character.*

There are none of the class called *secular*. Religious teaching is an essential feature of the instruction. The superintendents have hitherto been generally personally religious agents, capable of taking, and accustomed to take, an active part in the scriptural instruction and daily worship. In the majority of the schools, the Bible is the recognized source and chief instrument of the religious teaching, the catechism not being required.

4. *Great stress is laid on the industrial training.*

In the reformatory schools more especially, regular daily labor in the field or workshop, or for girls in the laundry, the house, or the needle-room, is insisted on; the working-time being generally from six to eight hours per day. The employments of the inmates in industrial schools are necessarily less laborious, the children being usually much younger, but the same principle is kept in view, that, as the evil to be cured has been always more or less the result of idleness and license, the remedy must especially prescribe and provide for labor and exertion, and the self-restraint which these require.

5. *The importance of supervision and occasional assistance after the inmates have left the schools, and while they are making good their footing in the world, is fully recognized.*

They are, as a rule, carefully kept in view and reported on, and, where necessary, aid afforded them. The differences which the annual reports and returns show in the success with which the operations of the schools have been conducted may generally be traced, more or less, to the different degree in which this after-supervision has been maintained.

6. *It is a fundamental principle of the system that the responsibility of the child's parents to provide for its maintenance and training should be enforced.*

This is a feature peculiar to the system as carried out in Great Britain, and has, undoubtedly, materially secured it from becoming a source of injury to the community at large.

The parents of each child committed to a reformatory or industrial school (if it has any alive) are summoned before a magistrate, their circumstances inquired into, and a payment toward the child's maintenance enforced, proportioned to their means in every possible case. The acts allow of this payment being assessed as high as five shillings per week, but, as a rule, the contributions are rarely higher than from one to three shillings. In a large number of cases, especially as regards the

children in industrial schools, the parents are too poor to pay; many are widows, themselves almost wholly destitute, and such are, of course, excused. * Many of the children are also orphans. But a very considerable proportion of parents are brought under contribution, and the amounts thus obtained have steadily increased, and now reach nearly £10,000 a year. The enforcing of these contributions is a part of the business of the inspector, who has a staff of assistants appointed for the purpose. It is chiefly carried out through the police authorities of the district in which the parents reside, by whom the payments are received and transmitted to the inspector, to be paid over to the treasury.

The justice and necessity of this part of the system are evident. No parent has a right to escape his share of the penalties of his child's misconduct, too often the fruit of his own neglect or dissolute conduct; and but for some such check, the temptation to the parent of shifting the burden of his child's support and education on the public would increase the number of candidates for reformatory training faster than the means of providing it could be supplied. The disease would be spread by the very means employed to remedy it, and the charge on the treasury, that is, eventually on all classes of tax-payers, would become insupportable. It is held in England that no system of reformatory training can be adopted with justice or safety to the community at large in which this element is omitted.

CHAPTER XVI.

STATE OF PRISONS IN SUCH OF THE BRITISH POSSESSIONS AS WERE REPRESENTED IN THE CONGRESS.

Reports on prison discipline as it now exists in India, Ceylon, Victoria, and Jamaica were submitted to the congress by delegates present from those countries. They were, however, not framed on the same plan as the reports whose substance has been given in the preceding chapters, and the information contained in them could not, therefore, be embodied with that furnished by said reports. A separate chapter is, consequently, devoted to a *résumé* of their contents.

§ 1. *India*.—Little special legislation has been given in India to prisons and prison systems. Prison regulations have been made, for the most part, without any direct sanction of law. Of the few prison acts which have been passed, none lays down any broad principles of prison discipline. One of them, however, that of 1834, contains some important provisions: it abolishes corporal punishment, substitutes fines in certain cases for labor, and empowers the government to introduce by degrees a reformatory prison discipline.

Nearly every presidency and province of India has its own special jail code. That of Bengal provides for a system of rewards to be given to well-conducted prisoners. There has also been established, for all India, a system of remission of sentence in reward of good conduct.

In the whole of India there was, in round numbers, in 1870, a daily average of 64,600 prisoners, including the life-convicts at Port Blair. There were, in the same year, two hundred and twenty-eight jails and an indefinite number of lock-ups. Of these prisons two are entirely cellular; the remainder are built on every conceivable plan, a large number of them being miserable mud-structures, which are constantly

washed away by heavy rains. In most of them male and female prisoners are separated at night. All work is in association, with the exception of cases of disciplinary punishment. There are sixteen central jails, intended for prisoners sentenced to an imprisonment of more than a year, but this intention is not rigidly observed. There are no reformatories, and but two special prisons for women. Until recently there were no female warders, and even now they are not found in all the jails. Prison officers, as a rule, are incompetent, corrupt, and underpaid, and no systematic effort is made to remedy this state of things. The annual cost of prisoners *per capita* is about \$30. Economy is practised at the expense of efficiency. Greater attention is paid to the diminution of expenditure than to the carrying out of any sound and sensible system of prison discipline.

There is little cell-accommodation—scarcely enough for the punishment of breaches of prison regulations—nor is there any system of classifying the prisoners of any practical value. No general measures of reform are possible till this state of things is remedied.

Imprisonment for debt still exists in India, but separate accommodation is provided for imprisoned debtors, and they are in all respects treated with humanity and a due consideration of their rights and necessities.

Much attention has recently been paid in India to prison statistics and the results obtained form the most reliable collection of facts in existence relating to the civil state of the British Empire in the east. The information gathered is divided into three categories—judicial, financial, and vital—and under each head a few of the most salient points of interest are noted. The vital statistics of the prisons of Lower Bengal since 1867 have been drawn up in the manner suggested by Dr. Farr, the president of the Statistical Society of London, than whom no higher authority exists. They show the average number of prisoners in custody, the number and causes of deaths, sickness and death-rates, average terms of sentence, duration of imprisonment, &c., &c. In addition, the Bengal returns contain facts connected with age, sex, caste, religion, occupation prior to and during imprisonment, sentence, dietaries, state of health on admission and discharge, and the locality of imprisonment in its influence on sickness and mortality.

Originally the chief occupation of prisoners in India was extramural, either in making imperial roads or in station-improvements. Subsequently remunerative industrial labor was introduced, and each prisoner had a task assigned him equal in amount to that performed by a fairly skilled artisan of the same class. It is sought to make it as much as possible an instrument of reformation, which is accomplished by teaching each convict some handicraft that will enable him to earn an honest living on his release, and by inculcating habits of industry that will counteract the idleness that is the proximate cause of much of the vice that leads to crime.

Industrial labor is the basis of the Indian system, although within the last two years out-door work has been revived, and large gangs of convicts are now employed on the canals; a system which, on moral grounds, must be considered a retrograde measure.

Prison dietaries in India have been arranged with a view to giving all that is really required for health and strength, and withholding everything that would place the prisoner in a better condition than the poor and honest in his own walk of life. The hospital dietary is unrestricted. A *penal* dietary, for serious breaches of prison discipline and for short-term prisoners, has also been introduced. The other punishments em-

ployed for prison offenses are fetters, separate confinement, flogging, and penal labor. Separate confinement cannot always be resorted to, on account of inadequate cell-accommodations, so that flogging is employed to an extent that is lamentable.

Education—*i. e.*, instruction combined with moral and religious training—is unknown in Indian jails. Religious acts and observances are practically forbidden to native prisoners, for whom no ministration is or can be provided. Christian prisoners have the aid of pastors, and other prisoners may obtain similar aid on application. Proselytizing by Christian missionaries is, however, peremptorily prohibited. For secular instruction no special provision is made, though much has been done by zealous individual officers in the way of primary instruction.

One of the chief peculiarities of Indian prison management is the employment of convict agency. The small salaries allowed render it difficult to procure suitable persons as prison keepers. This led to the trial, many years since, of well-behaved, long-term prisoners in this capacity. So successful was the experiment that the practice has now been extended to the whole of India, special provision for it having been introduced in all the jail codes. As a reward for good conduct and strict obedience to prison rules, all convicts whose behavior has been exemplary throughout, and who have completed the prescribed term of hard labor, are eligible for the offices of convict-warder, guard, and work-overseer, which offices can never exceed 10 per cent. of the criminals in custody. The financial and reformatory results of this system have been satisfactory. It teaches self-respect and self-control, and few prisoners who have held such offices have relapsed into crime.

There are no prisoners' aid societies in India. In the large stations, a few philanthropic individuals occasionally interest themselves in the matter, but the constant changes in Indian society have rendered continual and combined action impossible. Convict artisans, trained in jail, find no difficulty in obtaining employment, and few who have attained any degree of skill ever return to prison.

The governors of provinces and the viceroy of India possess absolute power of pardon, but such powers are never exercised without careful inquiry and grave deliberation.

To nearly every prison is attached a garden, wherein are raised the vegetables and fruit required for prison consumption, any balance over and above the prison wants being sold. The chief object of the garden, however, is to counteract the scorbutic tendency of sedentary employment in work-sheds, by affording a wholesome amount of out-door occupation in useful directions.

§ 2. *Ceylon*.—The principal prison upon the island in Ceylon is that at Wellikada, an account of which was prepared for the congress by Mr. H. J. Duval, inspector-general. Here separate confinement with rigorously penal labor is enforced during the whole term of short sentences and the first six months of long sentences. Long terms of imprisonment are divided into three stages, called, respectively, the penal, secondary, and upper stage.

On admission, every prisoner is placed in the penal stage, there to pass the first six months, in the case of a long sentence, or the whole term, in that of a short one. No part of this stage is remissible, but it may be prolonged by misconduct. This stage is found to exercise a most beneficial influence in subduing the prisoners, and preparing them for the next. In the case of short-term men, it is highly deterrent.

At the termination of the penal stage, prisoners are removed into the secondary or industrial hard-labor stage. Here the mark system begins.

Each convict is debited with a number of marks corresponding to the number of days in his sentence, minus the first stage. By industry and good conduct, he may earn nine marks per week, and this maximum continued will close his mark account at seven-ninths of the period, the remaining two-ninths being remitted. If he earn only eight marks weekly the reduction of time is only one-ninth.

Breaches of discipline are rare. The punishments employed are forfeiture of marks, a return to the penal stage, and flogging, which latter, however, is never used except in cases of mutiny, and the number of lashes never exceeds twelve. The wholesome dread of a return to the penal stage is usually sufficient to stimulate the convicts to industry and obedience. In this stage, they are employed at such hard labor as they may be fitted for by their previous habits and occupation in life, the object being to make their labor as productive as possible.

Religious instruction cannot possibly be general in a country settled by many races, professing a multitude of religious or superstitious creeds. At the large prisons, the ministers and native catechists of various missionary bodies hold service on Sunday, but attendance on these ministrations is optional with the prisoners. Native school-masters also give instruction in the vernacular languages on each Sunday afternoon; but, attendance at school being optional, few avail themselves of the offered instruction, the great majority preferring to spend the day in idleness.

The third or upper stage is a privilege awarded only to the few. Prisoners who have served at least two-thirds of their sentence, and who have, while in the industrial stage, distinguished themselves as good prisoners and skillful workmen, are promoted to be prison constables, their duties being to assist the subordinate officers in the maintenance of order and discipline in the prison. When employed on public works, they act in the capacity of foremen, being generally selected with a view to their fitness for such work. While holding this appointment, they are credited with one rupee per month, which is paid to them on discharge from prison.

§ 3. *Jamaica*.—On the island of Jamaica there are four classes of prisons: 1st, the general penitentiary; 2d, county jails; 3d, district prisons; 4th, short-term prisons. To the first of these establishments are sent all convicts whose term of sentence exceeds twelve months and all soldiers and sailors condemned by court-martial. The labor is both penal and industrial. The tread-mill is made slightly remunerative by being attached to a mill for grinding corn. Prisoners, when not at work on the tread-mill, are employed in quarrying and cutting stone, and as brick-makers, lime-burners, carpenters, coopers, masons, blacksmiths, tinsmiths, tailors, shoe-makers, &c., under the instruction of competent tradesmen employed for that purpose, and supervised by an intelligent overseer of works from England. The convicts work in association, but in silence. The women are employed in the domestic work of the prison and in picking coir.

The diet is designed to keep the prisoners in good health, but without pampering them. The cost per diem for each convict during the past year was a little more than 3½d.

A clergyman of the church of England is employed as chaplain, but all prisoners are allowed to see the clergy of the denomination to which they may belong.

The reward for good conduct, awarded to all prisoners except recidivists and those guilty of a peculiar class of crimes, is promotion to the "license-class," a position much coveted, and to which a convict is eligible after having satisfactorily served half his time. This promotion carries with it a remission of one-fourth of the original sentence.

The punishments employed in the case of males consist of degradation from the "license-class," solitary confinement on bread and water, and, in exceptional cases, the cat, which, however, is never administered except with the approbation of the governor of the island, to whom is sent a full statement of the case. The only punishments for women are solitary confinement on bread and water and degradation from or denial of admittance to the license-class. This degradation, whether in the case of men or women, involves the loss of all the time earned by the prisoner through good conduct. So wholesome a dread is felt by the convicts of this penalty that it has not been found necessary to inflict it in a solitary instance during the last two years.

The county jails are used chiefly for the confinement of debtors and persons awaiting trial. They are employed as places of punishment only for misdemeanants. No labor is carried on.

In the district prisons (five in number) are confined prisoners whose sentence does not exceed twelve months. The inmates are visited daily by a government medical officer, and by the inspector of prisons not less than once in three months. The magistrates of the parish also act as official visitors, and have power to inflict punishment—*i. e.*, to sentence to solitary confinement on bread and water. The nearest clergyman acts as chaplain on Sundays. The prisoners are confined in association wards, the only separation being that of the sexes.

The short-term prisons (of which there are also five) are designed to supplement the district prisons, by obviating the necessity of sending petty criminals twenty or thirty miles to undergo a sentence of a few days' duration, the whole of which was before their establishment sometimes occupied in making the journey. Prisoners may be received into these prisons for periods not exceeding sixty days. They are supervised by a sergeant of constabulary, whose wife acts as matron, and by a task-master. They are employed on the main roads breaking stones and picking coir.

The inspector-general of prisons on the island, Mr. Shaw, in the paper submitted by him to the congress, of which this section is an epitome, calls attention to the very marked falling off in the number of crimes committed by women, the decrease since 1864 having been 70 per cent. This reduction he attributes to the fact that, in 1864, orders were given to have the hair of women sentenced to hard labor cut close; immediately the decrease commenced. A negro woman prizes nothing so highly as her hair, and it is a common practice for many of them to have their hair cut off before trial, and kept for them until their release, when they fasten it on again. Those who are less provident sedulously seclude themselves until their hair has grown.

Mr. Shaw says that after considerable experience with prisoners, and having paid much attention to all that has been said and written on the practicability of deterring people from crime, he is compelled to confess that he knows no preventive measure so efficacious as cutting off the hair of negro women.

§ 4. *Victoria*.—There is but one convict-prison in Victoria, which is for males only. The officers are appointed by the governor in council, to hold office during good behavior, and after service they have retiring gratuities and yearly pensions.

The prisoners are divided into six classes and may earn a remission of a portion of their sentence by good conduct. Those in the first class are kept in strict separate confinement, eating, working, and sleeping in their cells; those in the second, third, and fourth classes labor in association, but are separated by night; in the fifth and sixth classes they

are employed on public works, receiving rations of tea, sugar, and tobacco, besides being allowed a gratuity amounting to 2*d.* a day in the fifth and 6*d.* per day in the sixth class. The punishments employed are solitary confinement and extension of the term of imprisonment. Resort is never had to corporal punishment. The prisoners do not wear the parti-colored dress, the effect of which is believed to be merely degrading.

There are four chaplains connected with the English, Roman Catholic, Wesleyan, and Presbyterian churches, each of whom holds one service every Sunday. A schoolmaster instructs all the prisoners in reading, writing, and arithmetic for one hour every day, and facilities are afforded for the study of grammar, geography, and the elementary mathematics.

There is no strictly penal labor, nor is the prison labor let on contract. The chief kinds of work are quarrying, building, shoe-making, tailoring, carpentering, weaving, and mat-making. The value of the labor performed has averaged during the last five years about \$85 per head, exclusive of work done for the prison itself. The average annual cost *per capita* in excess of this sum, including food, clothing, and a proportionate share of the salaries, besides the estimated rent of the prison-property, has been about \$12.

No supervision is maintained over discharged prisoners, nor is any interest taken in their subsequent career.

The county jails are divided into two classes, one class being under the charge of the penal department of the government, the other under the police; about six months in the former, in the latter a few days, is the average sentence. In none of the jails is there penal labor, and in the police jails there is no labor of any kind. The prisoners work in association, and the average annual net earnings *per capita*, exclusive of any portion allowed to the prisoner himself, have been during the last five years about \$18. The shortness of the sentences (nearly one-half being for less than a month) prevents any permanently reformatory results.

There are three reformatories in Victoria, two of which are wholly, and one partially, supported by the state. As far as practicable the children's parents are required to contribute to their support; but the amount received from this source is insignificant. The limits of age within which children are received are eight and fifteen.

The boys are employed in tailoring, shoe-making, carpentry, sail-making, and seamanship. The girls perform the domestic work and are instructed in needle-work. The products of the inmates' labor are not sold, the work done being entirely for the use of the institution.

In nearly every case the children obtain a situation or are sent to their parents. In the latter case they are no longer under the care of the institution. When licensed to employers they are considered still under its control, and may be returned to it if not doing well.

Prizes are given for proficiency in school and in labor, and early discharge to service for good conduct. Those who distinguish themselves in this particular are appointed monitors, captains of messes, &c. The punishments are extra drill, privation of food for short periods, and corporal punishment, not exceeding twelve stripes, on hand or breech.

Record is made of the children's conduct while in the institution, and also after their discharge, as far as it can be ascertained.

PART SECOND.

WORK OF THE CONGRESS.

INTRODUCTORY.

It is obvious, on the slightest reflection, that a body like the Congress of London, coming together from so many different countries and composed of members having little previous knowledge of one another, and ignorant especially of each other's opinions on the questions which they had met to consider, would be ill-suited to intelligent, harmonious, and, above all, effective work, without some carefully-prepared chart to guide them in their labors. Impressed with this idea, the national committee of the United States had embodied in its final circular letter, addressed to the national committees of other countries, a recommendation that an international committee, to be composed of one or several members from each country which proposed to take part in the congress, should meet in London on the 24th of June, ten days in advance of the congress itself. Conformably to this recommendation, the proposed committee convened at the time and place named, and organized by choosing the undersigned as chairman and Edwin Pears, esq., as secretary, the latter gentleman to act as such throughout the sessions of the congress. Even the international committee found itself too unwieldy a body to do the work assigned it in a satisfactory manner, and designated a sub-committee, which it named an international executive committee, consisting of one member from each country represented in the general committee. Of this smaller body, G. W. Hastings, esq., of England, was made chairman. These bodies met usually on alternate days, though sometimes on the same day at different hours, the smaller preparing the business and reporting it to the larger for a broader consideration and a final determination. The two committees thus labored assiduously at the work of arranging the programme of proceedings, and all other matters of a preparatory kind, down to the very eve of the opening of the congress. Before dissolving itself, the larger committee constituted the smaller a permanent committee, to sit every morning for the purpose of considering any questions that might arise in the progress of the labors of the congress, and especially to prepare business for it from day to day. It also named the Right Honorable the Earl of Carnarvon permanent president of the body, although, owing to the state of his lordship's health, it was understood that he would be able to preside only at the first session, when he would deliver the opening address. The arrangement resolved upon for securing a presiding officer throughout the continuance of the congress was to select a member as vice-president each day. The general committee, before its dissolution, did the undersigned the honor to name him for the first day, and left the duty to the executive committee of designating the gentleman to act as chairman for each of the succeeding days.

The programme of questions to be submitted to the congress was arranged upon the principle of considering, first, the treatment of the prisoner before conviction; secondly, his treatment during the time of

punishment; and, thirdly, his treatment after discharge. But a considerable number of questions, deemed important to be discussed at this meeting, do not properly fall within either of the above categories; besides which, the whole subject of juvenile delinquency and its treatment, and that of penitentiary systems, refuse equally the strictly logical classification indicated above. These matters are accordingly treated in three distinct chapters of the present report.

The English government had not originally given that cordial hospitality to the idea of the congress which had been extended to it by other governments, both European and American. But whatever coolness it may have shown at first was amply atoned for by the fullness and warmth of its sympathy after the congress had been organized and had gotten fairly at work. It deputed Major Du Cane, chairman of the directors of convict-prisons, to attend the sessions of the congress, and instructed him to give all possible information concerning the English convict-system and its workings. It threw open to the members every prison and reformatory in the United Kingdom, and gave instructions to their governors to afford special facilities for observing and understanding everything connected with their organization and management, even to the minutest details. His Royal Highness the Prince of Wales attended a *soirée* given to the congress by the people of London, at which members were individually presented to him, with many of whom he conversed freely, expressing a warm interest in the meeting, and in its objects and work. The lord chancellor gave a state dinner to the American judges and some other leading American delegates; and the Earl of Granville, secretary for foreign affairs, invited the entire congress to a magnificent *soirée* at his rooms in the foreign office. Several members of Parliament also, besides attending and participating in the proceedings of the congress, gave dinners or *soirées* to its members at their residences in town or invited them to their country seats in the neighborhood. The home secretary, the Right Honorable H. A. Bruce, to whose department the care of prisons belongs, attended in person one of the sittings of the congress; and, in an eloquent address to the body, he expressed the gratification he experienced in appearing before it and in conveying to it his own and the thanks of the government for having chosen England as the place of meeting, and their high appreciation of the spirit in which the members had undertaken their task; adding highly interesting statements in regard to prison work and prison reform in England, and particularly in reference to the diminution of crime in that country, as shown by the penitentiary returns received at his office during the last ten years.

As has been already stated in the general introduction to this report, the congress was opened on the evening of the 3d of July by an address from Lord Carnarvon; and on the morning of the 4th its real work began. The undersigned, appointed president for the day, opened the work of the congress with the short address which follows:

LADIES AND GENTLEMEN: Called by the kindness of the international committee to preside over this dignified assemblage, on this its first working-day, while expressing my gratitude for so distinguished an honor, I beg to offer a remark or two touching the occasion which has brought us together from so many different countries. This congress is convoked in the interest of humanity, of civilization. It is composed of thinkers and workers in one of the great departments of social science and social reform, representative men and women gathered literally from the ends of the earth. We have here representatives of governments, of prison societies, of penal and reformatory in-

stitutions, of governing boards of penitentiary establishments, of high courts of criminal jurisdiction, of police boards, of associations of jurists, of the penal law departments of universities, and of the academy of moral and political sciences of the Institute of France. There are present also many other persons who, though not belonging to either of the categories named, have long been devoted to penitentiary and humanitarian studies, and who have brought their great knowledge and their great hearts to help us in our labors. The special work of this congress is to study, and, if possible, to solve, the problems, as grave as they are difficult, involved in the treatment of crime and criminals. The congress, composed as has been explained, and embodying, therefore, representatively, the knowledge, experience, and wisdom of the world on this subject, has a great opportunity before it, great and full of promise. It is as great an opportunity as the noblest ambition could desire; but equally great is the responsibility which it brings with it; for let it be remembered that opportunity and duty are evermore correlative. God has joined them together, and man cannot put them asunder. The business of this congress, if I conceive it aright, is not to fritter away its time, strength, and zeal in minute details, and especially not to give expression to a preference for one penitentiary system over others, but to agree upon certain broad principles and propositions which may be made to underlie, permeate, vivify, and, above all, to render fruitful any and all systems of criminal treatment. We have come together to give shape, point, and practical force to a great movement in favor of penitentiary reform, may I not almost say a great upheaval of the public conscience throughout the civilized world on this subject? Let us see to it that we rise to the full height of our duty. Let us see to it that we give a wise direction, as we can hardly fail to impart a strong impulse, to the movement which I have indicated. If we do not fail in this, as I feel sure we shall not, and if we follow up our present work with some permanent organization that shall perpetuate, enlarge, and intensify its results, it seems to me not an unreasonable hope that the next fifty years will see a progress in the methods and processes of criminal treatment, and especially in the principles and application of a reformatory prison discipline, which all the ages hitherto have scarcely witnessed.

Ladies and gentlemen of the congress, let us address ourselves to our work with courage, resolution, intelligence, and, above all, with a hearty love of truth and a genuine brotherly accord, and we cannot doubt that the guidance and blessing of Heaven will attend our labors.

CHAPTER XVII.

THE PRISONER AFTER ARREST AND BEFORE CONVICTION.

This question was stated in the following terms: "What should be the treatment of prisoners before conviction?" The discussion was opened by Count de Foresta, procureur-général of Ancona, Italy. He expressed himself as opposed to associated imprisonment prior to conviction, more especially in cases where there was reason to fear that a prisoner by such association might defeat the ends of justice. He thought it an absolute duty of the authorities to provide isolation for such prisoners under arrest as might desire it; and in no case should a man who

was still deemed innocent be compelled to associate with others in a prison against his will. It was, at best, a hard necessity that a man should be locked up in a jail before he was convicted of any crime.

The Rev. Mr. Collins, of Tremardale, Bodmin, thought that the frequency of imprisonments before conviction might be, and ought to be, largely reduced. The plan he suggested to effect this was that, in all cases at present bailable, a system of personal bail should be substituted for a money bail. Instead of the existing arrangement, by which a sum of money is forfeited on the prisoner's failure to answer his recognizance, he would make the forfeit, in case of his non-appearance a full day before that appointed for his trial, liability to the full penalty of the crime with which he stands charged. He thought that this would secure his attendance much more effectively than the present system of bail, since no sane man would expose himself to a certain and extreme penalty, when, by surrendering himself, he would have all the chances of escape which a trial offers. Such a plan would have the advantage of placing the poor man, now often unable to obtain sureties, on a level with his richer neighbor. It would also tend to imbue the public mind with the idea that imprisonment is in itself a punishment and a disgrace; it would save many an innocent man from an imprisonment not deserved; it was in strict accord with the maxim that every man was to be deemed innocent until proved guilty; it was an economical arrangement, as it would save the cost of the prisoner's support, and humane, since it prevented the sundering of wives and families from their bread-winners.

Mr. Stevens, of Belgium, said that in his country safe custody was regarded as the only object of preliminary detention, and hence all who were able were allowed to purchase small luxuries. Before trial, all prisoners were well accommodated.

Mr. Pownell, of England, said that the bench, with which he was connected, had anticipated this question. Every man being considered, in law, to be innocent until proved guilty, it seemed that an undeserved stigma was inflicted upon a man by sending him to jail before conviction. Hence a house of detention had been built for the reception of persons awaiting trial. The inmates were isolated, thus saving them from contamination and also from taunts flung at them, after liberation or acquittal, of having been incarcerated in a felon's cell. Various privileges were allowed them, such as the purchasing of their own food, if their means were sufficient, daily visits from friends, unrestricted consultation with their legal adviser, &c. This plan, he believed, was more just than to brand with the prison mark an untried man.

CHAPTER XVIII.

THE PRISONER DURING HIS INCARCERATION.

§ 1. *Proper maximum of prisoners for any single prison.*—The question "What ought to be the maximum number of prisoners or convicts detained in any prison?" was introduced before the congress by Mr. Ekert, of Germany, who said that during the many years through which he had been head of the prison at Bruchsal, this question had received much of his attention. He believed that five hundred should be made the maximum, and that the number should rather fall below

than exceed that figure. This proposition he urged on the triple ground of security, justice to the prisoner, and hope of reformation. A larger number would, in his opinion, render individualization extremely difficult, without which there can be no effective reformatory treatment of prisoners. Nor does an increased number of subordinates obviate the difficulty. The above view is in accordance with one of the fundamental principles of the Crofton prison system. The question of cost should not be made paramount, since where money considerations prevail, all reform too frequently comes to an end. He had arrived at his opinion after consultation with many competent authorities, whose belief coincided with that which had sprung up in his own mind after many years' experience as a prison officer and as president of the German Prison Society, in which latter capacity he had had an opportunity of obtaining information from all parts of the world on the operation of different prison systems.

Sir John Bowring, of England, was of opinion that large prisons were preferable to small ones, not only on the ground of economy, but also as affording a wider scope for emulation and moral improvement. The larger the scale on which labor is conducted, the more profitable are its returns, and he believed the same principle to hold true in the case of the operation of moral influences. Instruction is most easily imparted in universities, and a clergyman is more likely to make an impression on a large congregation than on a small one. The elements of improvement and the tendencies to deterioration should be considered in the treatment of each prisoner, and the larger the scale on which such observations are made, the more valuable would be the results.

M. Vaucher-Crémieux, of Switzerland, agreed with Herr Ekert, while admitting that, for financial reasons, a large number might be desirable. The difficulties of supervision, however, particularly in cellular prisons, were greatly increased. He quoted M. Demetz, director of the reformatory at Mettray, France, as holding that three or four hundred was a sufficient number for prisons of this class, and expressed his belief that in prisons conducted on the congregate system one thousand should be the maximum.

M. Stevens, of Belgium, thought that the question of expense should be subordinated to that of reformation. Looking at the question from that stand-point, he thought that in no prison should the number of convicts exceed five hundred, and in cellular prisons it should be even less.

Dr. Mouat, late inspector-general of prisons in the province of Bengal, India, while agreeing with M. Stevens as to the superior importance of reformation over economy, believed that excessive subdivision of prisons might be justly opposed as too costly. He believed that individual treatment was entirely practicable in a prison containing one thousand inmates, if the staff of subordinates were large enough to attend to the details and to the treatment of each prisoner. This number had been made the maximum by law in India, in 1864, partly on financial grounds, and partly with a view to moral and disciplinary treatment.

M. Petersen, of Norway, had, in the prison of which he was the head, an average of two hundred and twenty-four convicts. He considered this number too small, believing that large prisons could be more easily managed than small ones. With a small number of prisoners there was a tendency to go too much into detail and speak too much with them. Prisons conducted on the separate system should, he thought, have between three hundred and four hundred inmates.

Hon. H. H. Leavitt, of Ohio, said that the state-prison of that State

contained one thousand prisoners, which number had not been found so large as to prevent reformation.

Mrs. Janney, of Ohio, remarked that the authorities of the Ohio state-prison were of the opinion that six hundred was a sufficient number, and that it would be impossible for a warden to become individually acquainted with one thousand.

Colonel Colville, for eighteen years governor of Coldbath Fields Prison, London, stated that the number of prisoners under his care at any one time had varied from one thousand five hundred to two thousand two hundred. He favored large prisons on financial grounds, and believed that, by the employment of a proper number of officials, all the advantages of smaller prisons might be secured, though he admitted that there was a tendency to limit the number of officials. Thus, while ten small prisons would have had ten schoolmasters, Coldbath Fields had but one. He had never, however, met with any difficulty in maintaining discipline, and a cheerfulness had prevailed which had often surprised him.

Dr. Frey, of Austria, thought it impossible to fix a precise number. The great question was how far the head of the prison would be able to come into personal contact with each prisoner. If, as in Austria, he was free from all economical matters, and had nothing to do but manage the prisoners and see that they were well treated, he could attend to a large number; but if he had other duties, the number must be smaller.

General Pilsbury, of New York, thought that five hundred or six hundred should be the maximum. He felt sure that he himself would not be able to give personal attention to one thousand prisoners.

Professor Foynitsky, of Russia, thought that individual treatment should not be sacrificed to financial considerations.

Mr. Frederic Hill, of England, contended that there might be individual treatment in large prisons. The Glasgow prison, when he was acquainted with it, had many hundreds, but there was individual treatment nevertheless.

Baron von Holtzendorf, of Prussia, considered number dependent on the system of management. In a cellular prison, five hundred should be the maximum, and perhaps three hundred would be better, but in public-works prisons there might be six hundred or one thousand.

§ 2. *Classification of prisoners.*—The question whether the classification of prisoners ought to be considered the basis of all penitentiary systems, associate or separate, was introduced by privy councilor d'Alinge, of Saxony, who prefaced his remarks by saying that the criminal is a moral invalid, whom we desire to help. This help can be rendered only by interrupting his criminal course, and by saving him from a relapse. In order to effect this end, three things are necessary: 1, care must be taken to ascertain the moral failing which prompted him to crime; 2, means must be employed adequate to the removal of this failing; 3, the convalescent must be provided with the full power of resisting, by dint of his own efforts, a relapse. The only means for the achievement of this triple end are education and classification. The first problem of the penitentiary authorities, then, is to obtain as clear an image as possible of the mental and moral condition of the prisoner. To the practised eye of the official, such an image is, in many cases, patent. In others, it will be necessary to isolate and watch the prisoner. Having made a moral diagnosis of the state of each prisoner, we shall find that he belongs to one of two classes: Either he is so depraved as to have no power of will to do good remaining, (in which case another will must be substituted for his own,) or he has sufficient power left to

rouse himself and strike out a better path on the strength of his spontaneous resolve. To one of the former class we say, "You *shall* become a better man;" those in the latter say, "I *will* become a better man." Thus the inmates of a penitentiary naturally divide themselves into three sections, which are best designated as disciplinary classes. Those who show little or no inclination to meet the educational endeavors of the authorities, only bending at the words "you *shall*," form the *third* disciplinary class, or lowest grade. Those who, with the thought "I *will* be better" in their minds, co-operate readily with the exertions of the authorities in raising their moral culture, and who, with a determined will and all their strength, profit by the means placed at their disposal, form the *second* disciplinary class. Those, lastly, who for some time have endeavored to improve, and justify a hope of steady progress on their return into society, form the *first* disciplinary class. Such a classification demands of the managers a course of action similar to that of the physician. They must, by employing adequate modifications of prison discipline and educational agencies at their command, treat the prisoner operatively, curatively, and dietetically. Such a classification, based on true psychological individualization, will and must, in every prison system, work to the highest benefit of the prisoner, and, in consequence, improve the political condition of the country adopting it. In Saxony, this system has been applied to 50,000 prisoners with the greatest success.

M. Stevens, of Belgium, said that in that country there are two systems of classification. One is based on external conduct: obedience, submission, and industry. Under this system there are three classes: the good, the passable, and the bad. The other rests upon moral character, a much more difficult matter to ascertain, since God alone can judge the heart.

Dr. Mouat, of England, had formerly had sixty prison officers under his control in India. It was their unanimous opinion that moral classification was impossible, and that a moral barometer was a chimera, since prisoners did their best to conceal their real character, lest they should suffer harsher treatment.

Mr. Tallack, of England, agreed with Dr. Mouat, and thought that the impossibility of moral classification was one of the strongest arguments for the cellular system, under which every prisoner was a class by himself.

Dr. Marquardsen, of Germany, member of the Reichstag, believed moral classification to be impossible. No doubt any system of classification was better than none at all, but he believed the cellular system to be the true basis.

Mr. Serjeant Cox, of England, was of opinion that there was a wide difference, morally speaking, between the man who committed a crime of violence under sudden passion and the habitual thief. The former was frequently far more severely punished than the latter, although his offense did not, of itself, indicate great moral depravity. He thought it monstrous that the two should be treated precisely alike in prison. A classification which only recognized these two categories, would be better than none.

Dr. Bittinger, of Pennsylvania, pointed out that the necessity for classification of some sort had always been recognized—first, in the separation of different sexes and different ages, and afterward in the construction of prisons for offenses of various grades. He thought, with Mr. Cox, that the man who had committed a crime in hot blood, or while intoxicated, and the habitual criminal ought not to be treated

alike in prison. The latter was hopeless, crime being his profession; while the former might be the victim of misfortune. A sense of justice was essential to reform; and if they were put on the same footing, the pick-pocket would despise justice, while the other would resent being made a felon. An employer knew the character of his men, and he believed that a prison officer might judge of the moral character of his prisoners by the same standard, *i. e.*, their actions.

Colonel Ratcliffe, of England, while admitting that classification was impossible in prisons where the sentences were for a few weeks or months, thought it practicable in convict-prisons where the sentences were of long duration.

Baron von Holtzendorff, of Prussia, said that M. d'Alinge's practical experience had refuted the allegation of impossibility. Isolation and the cellular system had arisen from the alleged impossibility of classification, but the progressive system involved classification, and the problem had been solved by Germany and, to a certain extent, by Sir W. Crofton's system. The mark system was a self-acting method of classification according to behavior. God alone could gauge the inner man, but the outer man could be tested by behavior and industry. If he played the hypocrite, he must be left to God.

§ 3. *Prison management—how far to be regulated by legislation.*—The discussion on this question was opened by Mr. Stevens, of Belgium. He thought that prisons should be placed under the direction of a central authority. The regulations of the public administration should determine the prison administration, the mode of surveillance, and the moral and material treatment to be adopted in conformity with the law; but a certain latitude should be left to the executive authority, making obligatory, however, a due regard for the principles fixed by the law. When prison treatment is not regulated by law, this latitude is too large and extremely liable to abuse.

Baron Mackay, of Holland, agreed with Mr. Stevens that the general principles of prison discipline should be laid down by legislation, but thought that, in view of the rapid advances made in this science, it would be unwise to attempt to prescribe details, which, when fixed by statute, could not be easily altered.

Mr. Frederic Hill, of England, said that the plan suggested by Mr. Stevens had been adopted in Scotland. Under the Scotch system all details were left to the authorities in charge of the prison, who were thus enabled to make such changes, from time to time, as experience might suggest. He thought that the English system fettered the prison officials too much. There should, however, always be some one directly responsible to government for the working of the regulations adopted in each prison.

Dr. Mouat said that the Indian system approximated to the Scotch. Minute rules should not be embodied in acts of Parliament, but left to experienced authorities, to be altered whenever it might become necessary.

Baron von Holtzendorff said that the criminal code of Germany had formerly given only the names of different kinds of punishment, but the Reichstag had asked the government to frame a rule defining each kind of imprisonment. In Germany, and especially in Prussia, all regulations for local prisons emanated from the government. There was, consequently, great uniformity, and no such difference could exist as prevailed in England between jails and convict-prisons. Some prison governors had no confidence in any system but their own, and it was necessary to put some restraint on them. The question whether or not

corporal punishment ought to be inflicted should be determined by the legislature, and not left, as in Germany, to the discretion of the governor. The maximum and minimum of severity should also be laid down by law, but the application—the determining what degree of severity to inflict—should be left to the authorities.

Mr. Beltrani-Scalia, of Italy, said that in that country, for a long time past, the law had laid down principles and left the mode of executing them to the authorities.

Mr. Hastings, of England, objected to any attempt to obtain the benefit of a uniform system by sacrificing local action. He considered diversity of experiment the only way of arriving at the best treatment. It was impossible to say what was the best system of prison administration under all circumstances, in all countries, or even in all parts of the same country. The legislature should lay down certain broad principles, but within those limits entire liberty should be left to local administration. Under a stereotyped system, which fettered the administrators, its faults—and there would certainly be some—would be without hope of remedy; whereas, by leaving room for experiment and diversity of action, a much better system would ultimately be reached.

Mr. Berden, of Belgium, said that in that country a special law, a modification of the Code Napoléon, laid down the principles of prison administration, but left sufficient discretion to prison authorities to deal with individuals as circumstances might dictate. Thus, although most of the prisons were being adapted to the cellular system, which system was favored by the legislature, prisoners who from ill-health or other causes were unfit for the cellular system were not subjected to it.

§ 4. *Whether whipping should be employed as a disciplinary punishment.*—Mr. Stevens was of opinion that it should not. Its tendency was to brutalize the prisoner, and thus neutralize the reformatory influences that should be brought to bear upon him. He deprecated the use of physical punishment of all kinds, believing that moral means were all-sufficient, if properly applied. The bastinado can never open the way to the heart. Such punishments, in the words of a French workman, affect only the prisoner's *hide*, while degrading him to the level of the brute. In Belgium, any prison official who had resort to the lash would be promptly dismissed from his post. It should never be forgotten that imprisonment is but a severe, though benevolent, means to the accomplishment of the prisoner's reformation. Experience has proved that good discipline can be maintained without frequent recourse to punishments, and that many prisoners are led to obedience by the moderation and justice displayed toward them by the administration. The idea that prisoners can be governed only by severity proceeds upon the mistaken belief that they are forever lost as regards an honest life. Such a belief overlooks the relation subsisting between crime on the one side and ignorance and parental neglect on the other, and those who employ such chastisement as leaves in the heart only sentiments of hatred and vengeance may justly be held responsible for the neglect of those moral and religious influences, which alone are able to lead men to obedience and duty.

Major Du Cane, director of English convict prisoners, believed that prisoners were persons whom discipline must reduce to a proper frame of mind. He believed it would be impossible to preserve discipline and protect the officers—a few men amid large bodies of prisoners, many of turbulent dispositions—without the fear of corporal punishment. He had himself known prisoners to acknowledge that but for flogging they would not have become tractable and reformed characters.

Dr. Mouat said that in Indian prisons, owing to their imperfect construction, the cane had been much more largely employed than the sugar extracted from it. Its infliction should, in his opinion, be restricted to cases where convicts were so degraded and brutalized that the lash alone would compel them to good behavior; but, while agreeing that moral means should be pushed to the utmost, he would still, in jealously-guarded cases, retain the power, in the hope that this would render its exercise unnecessary.

Mr. Shepherd, for thirty years governor of the Wakefield prison, England, with an average of one thousand inmates, stated that during all that time no corporal punishment was inflicted there for prison offenses. He doubted whether in cases where it was inflicted every other means had first been tried. He favored its entire abolition. Up to his resignation (six years ago) he had remarked that nearly every prisoner subjected to corporal punishment returned to the prison again.

Dr. Marquardsen, of Bavaria, said that in his country corporal punishment had been abandoned several years ago, both as a means of public punishment and as an agency of prison discipline. The respect and obedience shown by prisoners had since greatly increased, breaches of discipline had diminished, and no prison authority desired a revival of the practice. The committee of the Reichstag, of which he had been a member, charged with the framing of a military code for Germany, had also set aside corporal punishment, so that not a blow could be struck in the whole empire.

Dr. Frey, as the governor of a prison with many hundred inmates, said that in Austria the use of the lash was abolished in 1866, experience having shown that it was demoralizing. It deprived the prisoner of that self-esteem which formed the basis of his moral improvement, and the strictest discipline might be maintained by other means.

Dr. Guillaume, of Switzerland, said it was also being abolished in his country.

Major Fulford, governor of the jail in Staffordshire, England, said that he was required to be present at every infliction of corporal punishment in his prison, and that he was invariably ill in consequence. Still, he believed it impossible to dispense with it in a prison where, as was the case with his, the prisoners were thoroughly degraded and vicious. There was a class of men who thought nothing of disgrace, but cared only for the stripes that they received.

Mr. Wills, governor of Nottingham prison, England, agreed with Major Fulford that flogging, though it should rarely be administered, was a useful power in reserve.

Mrs. Julia Ward Howe, of Massachusetts, thought the only thing to be said for flogging was that it was a time-saving process. Reason would gain as much in time. She was sure that no brutally ill-treated woman would thank the prison officials for sending her husband home more brutalized than before. She would never say to any prisoner, "You are a brute?" Rather would she say, "You are God's child; do not dishonor His image, as I cannot, no matter what have been your faults, dishonor it in you."

Mr. Frederic Hill said that for seven years, while he was inspector of prisons in Scotland, no corporal inflictions were allowed, nor did he hear any prison governor express a wish for the power to inflict such chastisement.

Mr. Hastings, of England, was glad to say that it had not been found necessary to use the lash in the county prison of which he was a visiting justice.

Sir Walter Crofton said that Englishmen generally favored the retention of the power of corporal punishment, in order that the necessity might never arise for its exercise. Prison governors had not the power of enforcing discipline by this means, which could be employed only on magisterial sanction. Its use was very exceptional, and resort was never had to it, until every other resource had been exhausted. In countries which had abolished flogging in prison, other punishments were employed, and if an unobjectionable substitute could be found for England, he would be rejoiced to hear of it. Every magistrate and prison governor had a horror of it, but all clung to the necessity of retaining the power to inflict it.

General Pilsbury, of New York, said he was no advocate of corporal punishment. He knew from experience, however, that all prisoners could not be governed by moral suasion; a few require severer discipline. He was convinced that no prison could be well and safely governed, unless ample power were vested in the chief officer to inflict special punishment, when called for, promptly, summarily, and, if need be, severely. He was of opinion, however, that this power should be given to the chief officer alone, and that not through the intervention of an advisory board. If prisoners knew that he possessed such a power, occasion for punishment would seldom arise; the knowledge would prove sufficient of itself to enforce discipline.

Dr. Marquardsen, of Bavaria, thought that the actual experience of what had been accomplished without the power to inflict corporal punishment furnished a stronger argument than the alleged maintenance of discipline by the existence of power which was seldom exercised. Such a method of reasoning he could not accept.

§ 5. *Kinds and limits of instruction suited to the reformatory treatment of prisoners.*—Mr. Stevens, of Belgium, opened the discussion by saying that the means of moral influence should consist chiefly in education, which should be of a quadruple character: industrial, scholastic, moral, and religious.

1. *Industrial education.*—The object of this part of his education is to provide the prisoner with the means of earning a livelihood on his discharge. Consequently, in the work-shops, more care should be taken to teach him his trade thoroughly than to make his labor productive. The primary object of labor, as an element of prison discipline, is to reform the prisoner and aid him to lead a reformed life on his discharge; hence it should be organized and conducted with a view rather to the future of the prisoner than to its effect upon the treasury.

2. *Scholastic instruction.*—This should comprise reading, writing, arithmetic, the elements of grammar, history, geography, geometry, and linear drawing, the latter especially in reference to trades and useful arts. The fact that public instruction has received so great an extension within the last few years renders it all the more important that a vigorous impulse be given to primary instruction in prisons. Illiterate persons should be the object of special care.

3. *Moral education.*—The teacher should, by special instruction in the school, inculcate the performance of social duties. This instruction should review the principal existing vices of society and demonstrate their sad and shameful consequences. Alternately the teaching should be based on the virtue opposed to the particular vice discussed at the preceding lesson, and should set forth as well its inherent beauty as the moral and material advantages associated with its exercise. Other lessons should be given on the most frequent violations of the penal code, especially noting such crimes as robbery, swindling, rape, assault, mur-

der, &c. In all moral instruction, an effort should be made to develop the sentiments of justice, family affection, and patriotism.

4. *Religious education.*—By this is understood the *special* religious instruction given by the ministers of each faith to the prisoners attached to it who are ignorant of the essential truths of religion. The use of the word *special* in describing this part of the prisoner's education signified that such instruction should be entirely independent of the religious instruction given by the chaplain to the prisoners in general. The sentiment of religion should be always deemed the last and strongest influence in a penitentiary education.

Mr. Tallack, of England, said that the prisons act, passed by Parliament in 1865, subordinated moral and religious instruction, which he believed to be an unsound principle. He deplored the small attention which was paid to convict education in the prisons of the United Kingdom.

Mr. Merry, a Berkshire magistrate, deprecated the pursuit of industrial labor to the exclusion of a proper attention to education, maintaining that silent congregate labor left the head empty and the heart hard.

Mr. McFarlane, of England, said that every care was taken in the Irish prisons to provide, first, for religious and then for industrial and literary instruction. He was surprised to hear Mr. Tallack arraign the prisons of Ireland on the score of neglect in this particular.

Dr. Varrentrap, of Germany, thought that secular should include physical education, since the mental and moral equilibrium depended so largely on the *physique*. He believed that no limit should be placed on secular instruction, and favored the task-system of labor as affording the prisoner a better opportunity for study.

Miss Mary Carpenter, of England, thought that society was bound to cultivate the powers God had given to a prisoner, and so enable him the better to discharge his duties as a prisoner and a man, and the difficulty attending the education of adults should form no obstacle. She regretted that government did not recognize this duty. Instruction should be so imparted as to be in itself a pleasure, and its influence would then be most salutary, as tending to wean prisoners from the indulgence of their lower passions. Scholastic, moral, and religious instructions were closely allied, and should not be separated.

§ 6. *Whether it is expedient in certain cases to employ an imprisonment consisting in mere privation of liberty without obligation to work.*—Count de Foresta, of Italy, thought that crimes of passion, not implying great moral perversity, should not be punished by ordinary imprisonment, but by simple detention in a fortress or other secure place, without the prisoner being required to labor, and without association with those sentenced to ordinary imprisonment. The natural distinction between crimes of passion and of reflection seemed to indicate the propriety of making a difference between the punishments awarded them. Crimes of the former category are frequently committed by persons who are young, well educated, and uncorrupted. For such prisoners he considered the solitude of a cell, with forced labor, merely an aggravation of punishment, and not calculated to have a reformatory influence. He believed that simple detention, with the privilege of reading, attending to their own affairs, and seeing friends, was a sufficient punishment. What descriptions of criminals should be treated in this manner should be determined by the penal code.

Professor Wladrinoff, of Russia, remarked that simple infractions of the law did not involve criminality. He thought it should be left to the

jury to decide to which class a prisoner belonged, it being a matter involving personal liberty.

Mr. Chandler, of Pennsylvania, said that the plan suggested by Count de Foresta was in most successful operation in Pennsylvania, and he believed that it might be made a success everywhere.

Dr. Mouat dissented from this view. He had been connected with prisons in India where such a system had been applied, and he believed it to be very corrupting.

Dr. Marquardsen said that the code adopted in Germany three years ago recognized the principle contended for by Count de Foresta. The distinction made there, however, was not between crime and crime, but between criminal and criminal, and it rested with the judge to decide whether the offender should be kept at hard labor or in *custodia honesta*. The latter class of criminals were imprisoned in a fortress. Speaking for himself personally, he believed that, in general, persons guilty of *minor* offenses should not be left without labor. He believed that the law of Germany embodied the true principle on this subject. Under its provisions, criminals were divided into hard-labor prisoners and such as were employed in the trades and professions to which they were accustomed.

§ 7. *Whether sentences for life are expedient.*—Baron von Holtzendorff, of Prussia, in opening the discussion on this question, called attention to the very decided difference in the view at present taken of the object to be attained by punishment and that which, as history discloses, was taken in the past. Salvation was now universally regarded as a primary end of correction, and this recognition of the principle that men ought to be reclaimed led to the agitation of the question under discussion. He did not, however, favor the abolition of life-sentences, if capital punishment were expunged from the penal code; and he believed that all who favored the abolition of the latter measure must agree with him. Imprisonment for life must remain the substitute for one or two centuries at least. But such a punishment should, like all other punishments, contain the elements of hope and fear: fear lest the term of imprisonment be actually for life, and hope of release after ten or twelve years on satisfactory proof of reformation.

Dr. Wines stated that, under the law of Missouri, a prisoner sentenced for life, who conducted himself with uniform propriety, became entitled to his liberty after fifteen years in the state-prison.

Dr. Mouat said that the same principle had been adopted in India.

Hon. D. Haines, of New Jersey, said that his objection to life-sentences lay in the fact that they left no hope in the convict's breast, without which there could be no reformation. Even if hope remained, it was too uncertain and remote to have much influence on the prisoner.

Mr. Stevens agreed with Baron von Holtzendorff, that life-long imprisonment was but the means to an end, and not an end in itself, but that it was demanded as a substitute in the event of capital punishment being abolished. Theoretically speaking, perpetual penalties should not exist.

Mr. Vaucher-Crémieux, of Switzerland, thought that the security of society forbade the liberation of an assassin or a man condemned to imprisonment for life. The possibility of a release would render society uneasy.

Mr. Hastings, of England, said that in that country there was practically no such thing as imprisonment for life. Though such sentences were passed, hope always remained, the prisoner being uniformly liber-

ated by the home secretary in the event of good conduct for a number of years.

§ 8. *Whether prisoners, on reconviction, should be subjected to a more severe disciplinary treatment.*—Mr. S. Petersen, of Bavaria, said that a recidivist apparently deserved severer treatment for the obstinacy of his criminal propensities. Yet in view of the fact that courts, in pronouncing sentence, always took into consideration the circumstance of a previous conviction, and, as a consequence, increased the length of the sentence, if the prison authorities also increased the severity of the punishment by a sterner disciplinary treatment, the prisoner was punished twice, which was manifestly unfair. The judge alone should award the increase of punishment.

Mr. Ploos van Amstel, of Holland, was of the same opinion.

Dr. Frey, of Austria, maintained that recidivists should be more severely treated. They felt this more sensibly than longer sentences. In the prison of Carlan, in Styria, where there were three stages of imprisonment, the first of which was exceedingly punitive, recidivists might be kept in the most severe stage for one-half their sentence, while those sentenced for a first offense were never kept in this stage for more than one-third of the time. The results of this system had been good.

Rev. Mr. Robin, of France, was convinced, by fifteen years' experience as prison chaplain, that the recidivist was never reformed by aggravated treatment. He gave an account of two men in a prison where he had been chaplain, on whom such treatment was tried. One died under it, and the other grew morose and stubborn; but when, at his request, the discipline was a little relaxed, the convict changed his course of conduct, and eventually, upon release, gave satisfactory evidence of reformation. Firmness should always be blended with kindness. To provide a discharged prisoner the means and opportunity of eating honest bread was a more effectual safeguard against relapses than a severity which was hostile to humanity and Christianity.

M. Stevens did not think that prison authorities should aggravate the punishment. The law should give longer sentences to recidivists, but all should receive the same treatment in prison; otherwise, there would be arbitrary differences, and the severity would go on increasing for the third and fourth offenses. It should be remembered that relapse was frequently caused by the prisoner finding every door closed against him on his discharge.

Count Sollohub, of Russia, thought that the proper punishment of recidivists was a question for the law, and not for the prison authorities. If the severity of the discipline were increased upon each conviction, a degree of severity would ultimately be reached, incompatible with reformatory influences. He agreed with Mr. Robin that prisoners' aid societies were the best means of preventing relapses and re-instating a prisoner in society.

Dr. Guillaume, of Switzerland, said that in that country recidivists were sentenced for a longer period than other criminals. In some cantons they were condemned to bread and water two or three days a week. This practice he did not favor, since it often left the prisoners in such a state of debility as to render a relapse easier. He deprecated recourse to a severity condemned by Christianity.

Count de Foresta thought, with Count Sollohub, that the law, and not the prison authorities, should prescribe the punishment of recidivists. He thought that any other plan would tend to cruelty. As Mr. Stevens had remarked, the fact that society was too often responsible for a prisoner's relapse should prevent excessive severity. He was fur-

ther opposed to the term *recidivist* being applied to a man, one of whose two offenses had been a crime of passion or excitement.

Rev. Dr. Bittinger, of Pennsylvania, advocated an increase of punishment for each new offense. In order to effect reformation, we must appeal to the criminal's sense of justice, but he would despise the justice which had the same punishment for the burglar, convicted of his fifteenth offense, as for the novice in crime.

Mrs. Julia Ward Howe, of Boston, thought that the criminal should be shown something better than his own savage standard of justice.

§ 9. *What ought to be the maximum of imprisonment, cellular or otherwise, for terms less than life?*—Dr. Marquardsen, of Bavaria, said this question was not so much one of principle as of adaptation to local circumstances. In general, however, he would say that the maximum ought to be fifteen years, with the possibility of reduction for good behavior. He believed, however, that the character of the punishment, as to mildness or severity, as well as its duration, should vary according to the heinousness or veniality of the offense; and in fixing the duration regard should be paid to the character of the punishment. In Germany, cellular imprisonment was generally limited to three years. He disapproved of the English system of sentences, under which there was no intermediate term between two years and five.

Dr. Frey stated that in Austria the term of isolated confinement did not exceed three years, while the longest term of imprisonment was twenty years.

Mr. Stevens stated that in Belgium the maximum of cellular confinement had been reduced from twenty years to ten, and then to nine and a half, when, if a man was found to be no better, he was placed in a congregate prison. It had not been found, however, that prisoners suffered more, either in mind or body, under the cellular than under the congregate system.

Mr. Moncure, of Scotland, said that in the prison at Perth it had been found that cellular confinement for more than three years produced insanity, notwithstanding that the prisoners had employment and communicated with chaplain, magistrates, and officers.

Baron Mackay said that in Holland the maximum of cellular confinement was, in 1851, fixed at six months, but had been increased, first to one year and then to two, and a further increase was favored. The term would probably be extended to three years as soon as the number of cells was sufficient.

Sir Walter Crofton referred to experiments carefully made at Pentonville, England, under the direction of Sir Joshua Jebb, formerly director of convict-prisons, the results of which showed that eighteen months was the longest possible period for which isolation could be safely maintained. During the time when transportation was employed as a means of punishment under the English law, the surgeons at the penal stations in the colonies reported that the condition of those men who had been kept in strict cellular confinement for a period of from two to two and a half years before being transported was particularly unsatisfactory. They were found to have suffered to some extent in their minds, and their wills were broken down. It was such reports as these that caused the reduction of the term of cellular confinement to nine months.

§ 10. *Whether or not imprisonment should be uniform in nature, and differ only in length.*—Count Sollohub, of Russia, in opening the discussion on this question, remarked that the object of a hospital was not to keep its patients, but to send them out cured. In like manner, the object of a prison should be to combat the moral malady, and return

patients to society cured. As hospitals, moreover, endeavor to guard against a relapse into physical disease, so the prison authorities should direct their efforts to prevent a relapse into the moral disease of crime. It should be considered in every case whether the offense was the result of perversity and a passion for crime, or of some sudden excitement or temptation. Different classes of criminals, like differently-affected patients, required various kinds of treatment, and every precaution should be taken against contagion, by which the disease might be aggravated and a cure rendered more difficult. Each kind of prison should have a special aim; a prison which attempted to effect two different objects would succeed in neither. There should be two classes of prisons: one for convicts whose characters evidenced moral perversity, the other for those whose offenses were the result of a sudden break-down of principle or of uncontrolled passion. This was the principle of division followed in Russia.

Dr. Mouat admitted that it was desirable to make punishment proportionate to guilt, but feared that there was no moral barometer by which guilt could be strictly measured.

Count de Foresta, of Italy, said there existed in that country and in France three classes of punishment: sentences to simple imprisonment, to reclusion, and to hard labor. The first class could not exceed five years, except in the case of recidivists, whose term might be doubled. The prisoner was employed in industrial labor. Reclusion had five years as a minimum and ten years as a maximum, and involved the loss of civil rights. Hard labor implied civic degradation and civil death, and persons sentenced to it for a term remained subject for their lives to police-supervision. Speaking for himself, he did not favor this system. He contended that there should be but one kind of sentence, the only difference being in length, and there should be different prisons with different disciplines for the various terms of imprisonment. Prisoners for three or four years should not be placed in the same buildings or treated in the same way as those sentenced for ten or fifteen years.

§ 11.—*Prison labor—penal and industrial.*—The question whether prison labor should be merely penal, or whether it should be industrial only, or whether there should be a mixture of both, was introduced by Mr. Frederic Hill, of England. Mr. Hill declared himself an earnest advocate of *industrial*, as opposed to purely *penal*, labor, such as the crank, tread-mill, shot-drill, &c. He recapitulated the main arguments for and against industrial labor in prisons. Its opponents, he said, based their hostility mainly on four grounds: 1, that it renders imprisonment less irksome, and consequently less deterrent, than it should be; 2, that it is difficult to procure for prisoners such kinds of work as will be really remunerative; 3, that, however suited to long imprisonments, industrial labor is not adapted to short sentences; and, 4, that its introduction into prisons subjects the honest, free laborers outside to unfair competition. In reply to the first objection, Mr. Hill urged that irksomeness is not the chief end of prison discipline. It neither prepares the prisoner for a life of honest industry himself nor eradicates motives to corrupt others, while it is highly improbable that its deterrent effect on others would be at all commensurate with the evils it engenders in those who are brought under such a system—the irritation, resentment, obstinacy, and hardness which it unquestionably produces; besides which, the confinement of a prison and the other privations attendant upon a convict's life are in themselves sufficiently irksome. The only true test whether a prison has become attractive, is

to open wide its doors to all comers, without demanding, as now, a qualification of crime. But although, during a considerable part of Mr. Hill's service as prison-inspector in Scotland, free entrance was really given, although no legal provision was made for the able-bodied poor, and although industrial labor was required of all, the proportion of paupers to compulsory prisoners was seldom more than one to fifty. To the second objection, Mr. Hill opposed his own experience as inspector in Scotland, where the main difficulties he encountered lay in the shortness of the sentences and the indisposition and incapacity of prison governors and their subordinates for this special duty. The third argument Mr. Hill met by showing, first, that, even in cases of short imprisonment, labor, productive in some degree at least, can always be provided; and, secondly, that when such punishments are but repetitions, often twenty or thirty times in succession, of the same penalty, the true remedy is not to render the system of discipline suitable to so absurd a practice, but, by a change in the law, to get rid of the practice itself.

In answer to the allegation of injustice done to honest mechanics by introducing trades into prisons, Mr. Hill pointed out that from the extremely small amount of manufacturing carried on at penal institutions the competition must necessarily be very small; and that from the care that a public department would be likely to take to avoid precipitancy in selling below the market-rates, the danger to ordinary trade from prison labor would probably be less than from the same amount of free labor. Moreover, cheapness in price is an advantage to the greater number, so that, even granting that prison manufactures did sensibly affect the permanent prices of articles, which he denied, such effect would be a good rather than an evil. And, as a last consideration, he urged that every shilling saved to the public by prison earnings is a shilling added to that fund from which wages must be paid.

Having thus noticed the arguments of the advocates of penal labor, Mr. Hill proceeded briefly to enumerate the grounds of his advocacy of the universal introduction of remunerative industrial labor into prisons. The following is a summary: 1. That to make labor useful and productive in prison, as well as out of prison, is in accordance with nature; that to strip it of these qualities is, if not absolutely unnatural, at least artificial; a course demanding justification and proof of its propriety—a proof not given. 2. That by means of useful and productive labor much of the cost to society of the apprehension, trial, and imprisonment of criminals may be repaid and something at least done toward indemnifying the persons wronged. 3. That such employment, being free from everything that is repulsive and degrading, becomes associated in the prisoner's mind with pleasurable thoughts, and tends to make him look upon work as deserving of respect. 4. That by this kind of work a prisoner, besides making the payments mentioned under the second head, may help to support his family and may provide a fund with which, at the end of his confinement, either to pay the cost of emigration or to have the means of making a fresh and honest start in his own country. 5. That prisoners who have been employed in useful and productive work are, at their liberation, much better armed against relapse into crime, as well as much better prepared to obtain an honest living, than those whose labor has been merely penal, and that, in fact, the proportion subsequently doing well is much larger.

Major Fulford, governor of Stafford jail, England, contended that prisons were not reformatories, but should be a terror to evil-doers. He considered that penal labor was necessary in the case of "repeaters,"

since the professional thief or drunkard was utterly insensible to high moral teaching. He thought, however, that such offenders should not be kept in a county jail, but sent to a convict establishment for a period long enough to eradicate his evil habits.

General Pilsbury, of Albany, thought penal labor destitute of any reformatory element. He had always found in American prisons that the most successful institutions, in a reformatory point of view, were those where industrial labor was so managed as to produce a substantial income.

Dr. Wines brought to the attention of the congress the large industrial prison of Count Sollohub, at Moscow, the reformatory results of whose discipline were remarkable, only nine prisoners having returned during six years out of 2,100 discharged. At this prison, each convict was permitted to choose the trade he would learn, and, on mastering it, was allowed two-thirds of his earnings. So great a stimulus was this to industry that a man often became a skilled workman in two months. To this system the distinguished count attributed the surprising reformatory results mentioned above.

Mr. Hibbert, M. P., of England, said that an act of Parliament of 1865 provided that the visiting magistrates might, under the sanction of the home secretary, substitute other forms of hard labor for the tread-mill, crank, and shot-drill. In Salford prison, penal labor was required of all prisoners during the first three months of their sentence, after which they might be employed in carpet-weaving, cocoa-mat making, &c. Nor was the penal labor wholly unproductive, since the tread-mill, besides pumping water for prison uses, supplied motive-power for the industrial labor. The prison earnings last year defrayed all expenses except the salaries of officers. The sentences were, as a rule, too short to allow of industrial labor being successfully carried on; out of 6,163 prisoners, 4,116 having been sent for terms less than a month, of whom 2,031 were sentenced for only seven days. Industrial labor being impossible under such sentences, he favored penal labor on the ground of its deterrent influence.

Sir John Bowring vehemently condemned the tread-mill, and rejoiced that continental languages had no word for it. It should be called a work-waster or wind-raiser. It hardened the old jail-bird, leading him to associate labor with non-productiveness, who well knew how to cast all the burden on the weaker or less experienced prisoners.

Mr. Ploos van Amstel, of Holland, said that remunerative industrial labor was adopted in the Dutch prisons, a portion of the prisoner's wages going to himself. He believed this system beneficial alike to the state and to the prisoner.

Colonel Colvill, governor of Coldbath Fields prison, London, said that he had the largest tread-mill in England in his prison, six hundred men being employed on it at one time. He never knew a man improved by it. On the other hand, accidents frequently occurred; many had their legs and arms broken; very recently a man undergoing a short sentence broke both his legs. It was, moreover, unfair, since the old hands could readily shift all the labor on their younger associates, who, especially if weak-chested, were sometimes injured for life.

Mr. Stevens, of Belgium, protested against all labor the tendency of which was to brutalize the prisoner. Penal labor was unknown on the continent.

Dr. Mouat said that during his experience in India he had found non-productive labor brutalizing. The tread-mill was tried at Calcutta, but caused many accidents and was abolished as cruel and unjust.

The anger and bitterness shown by prisoners on ascending or descending it had always made him feel that it was unchristian. To make prisoners miserable is not the true way to regenerate them. They must have an interest in their work, and be taught to apply it to useful purposes. The prisoners under his charge had, during the last five or six years of his administration, repaid by their labor 40 per cent. of the cost of their maintenance, thus relieving the tax-payers and preserving the convicts' self-respect.

Dr. Frey, of Austria, said that in the Austrian prisons industrial labor prevailed. This alone would call forth the full working powers of the prisoner.

CHAPTER XIX.

THE PRISONER AFTER HIS LIBERATION.

§ 1. *Best mode of aiding discharged prisoners.*—Mr. Murray Browne, secretary of the Metropolitan Discharged Prisoners' Relief Society of London, opened the discussion with a paper showing the operation of the English system of aiding liberated prisoners. The thirty-four societies established for this purpose are all voluntary associations of benevolent persons. The majority, however, possess a semi-official character, from the fact that the gratuities allowed by law to the prisoner on his discharge are, instead of being given to him directly, placed in the hands of a prisoners' aid society in trust, the society being required to account for each sum so received, which varies in amount from a few shillings to £3. The additional funds required by the societies for the prosecution of their work are raised by voluntary contribution.

These societies may be divided into two classes: those which assist men and those which assist women. Of the former, only two maintain homes or refuges. The most important of these is the Wakefield Industrial Home, where discharged prisoners are maintained as inmates, and kept at industrial work, often for a considerable time, until employment can be procured for them elsewhere.

This system has been tried in many other parts of England; but, although its success at Wakefield has been admirable, elsewhere it has failed, and a majority of the societies prefer another plan. They aim to find work for the prisoner as soon as possible, to provide him with pecuniary support while waiting, and to aid him morally, by advice and assistance, as far as may be in their power. The most difficult part of their task is the finding of employment. For this purpose a paid agent—usually an old police-officer—is employed, who is required to use great judgment and perseverance. It is found, in general, that the prisoner's best chance lies in a return to his own neighborhood, there to resume his former trade or occupation. Emigration is very seldom resorted to, chiefly on account of expense. Many lads are sent to sea in the merchant-service. As a rule, the difficulties in the way of obtaining situations for discharged male prisoners are not of such a nature that they cannot be overcome by tact and energy. There are, however, some persons fitted only for situations involving trust, such as clerks and others, for whom it is very hard to find employment. The society with which Mr. Browne is himself connected has, for the past eight years, aided five hundred liberated prisoners annually; and it has been the experience of that organization that it is never necessary to turn adrift a man able

and willing to work because no work could be found for him. This, Mr. Browne stated, was the general experience of prisoners' aid societies throughout England. And it further appears, from the records of his society and others, that not more than 5 per cent. of those who have been assisted in finding work have been recommitted.

The societies which aid discharged female prisoners have, in some respects, a more difficult task, since, with the exception of a certain number of first convictions, almost all convicted women in England are prostitutes as well as thieves, thus requiring a double treatment. Besides which, private families very naturally object to receiving women fresh from the prison walls, the genuineness of whose reformation has not been tested. Accordingly, all female prisoners' aid societies employ homes of some sort or other.

The refuges for *convict*-women (*i. e.*, women who have been sentenced to five years' penal servitude) are three in number, and possess a definite official character, somewhat resembling the intermediate prisons of the Crofton, or Irish, system. No prisoner is allowed to enter them until she has received a certain number of marks in prison and has served a fixed proportion of her sentence, when she receives a *ticket of leave* and, at her own request enters the home, from which she may be returned to the prison for misconduct. While she remains at the refuge, she is employed in industrial labor. When the sentences of the inmates expire, the managers find employment—usually at domestic service—for all those who require it. The results are of the most satisfactory description. These homes for *convict*-women, being, in one sense, a part of the prison system, are partially supported by the state, but in part also by voluntary contributions.

Other societies aiding discharged female prisoners exercise their own discretion as to the women they receive into their homes. They have no legal control over the inmates, nor do they receive any considerable assistance from state funds. They usually place their *protégés* at domestic service when they leave the homes.

Mr. Browne stated that the societies in general found themselves greatly hampered in their work by the want of funds, which, he remarked, was to be deplored on economic as well as reformatory grounds, since the pecuniary gain to the state-coffers from the reformation of even a few prisoners would pay the whole expense of a prisoners' aid society over and over again. He was of opinion, therefore, that liberal assistance should be granted from the public funds to these organizations.

Mr. Powell, of New York, believed it to be the duty of government to found asylums for discharged prisoners, which should not be called prisons or houses of refuge, but industrial institutions. These institutions he would have conducted in some measure on the co-operative plan, so that the laborer should share the advantages of his toil. In addition to these establishments there should be in every community voluntary societies for aiding discharged prisoners. Lastly, he believed that prisoners should be taught the lesson of abstinence from intoxicating liquors as a beverage.

M. d'Alinge, of Saxony, considered the question under discussion a most important one. There were in his country several societies for the aid of liberated prisoners, King John having founded the first forty years ago. Lately these societies had been extending help to the families of discharged prisoners also.

Mr. Rankin, of England, said that he was honorary secretary of a society which undertook the care of prisoners discharged from convict-prisons exclusively, while the other thirty-three societies took care of

those discharged from county prisons. The record of re-convictions from 1869 to 1871 showed that of those whom his society had aided less than 6 per cent. had relapsed into crime.

Baron Mackay, of Holland, stated that in the Netherlands a society for the aid of discharged prisoners had existed since 1823. Members of the society visit the prisons and distribute good books to the inmates. On a prisoner's discharge the society tries to find a situation for him, gives him clothing and tools, or, rather, pays for his emigration. Especially are juvenile offenders made the object of its care. The society formerly maintained, at the city of Leyden, a school for the training of this class of delinquents for the navy. Unfortunately, however, owing to the refusal of the government to receive the inmates as volunteers, this institution had to be abandoned. The society has many branches in different places in Holland, and in sundry towns it has ladies' committees to visit female prisoners and promote their getting situations after their discharge. Experience has shown how eminently fit ladies are for these duties.

Mrs. Meredith, of England, founder and manager of an establishment for the aid of discharged female prisoners, presented a paper in which the increased proportion, year by year, of recommitments of women was noticed, and the proposition that it was impossible to help this class of criminals efficiently without the aid of women was strenuously urged.

Rev. Mr. E. Robin, honorary secretary of the Paris Protestant Discharged Prisoners' Aid Society, said that in France the work of caring for discharged prisoners (called patronage) embraced industrial, moral, and religious instruction. Its aim was twofold, viz: First, to improve the prisoners' moral condition; and, secondly, to remove the distrust felt toward them, thus removing the two chief causes of their relapse into crime. The patronage extended by the Paris society commences by making a selection of the prisoners, through visiting them while in confinement, and by supplying them with religious books. On his discharge, the prisoner receives a card, and is thereby constituted a *protégé* of the society, who furnish him with food and clothing (no money is given) for a few days. When he obtains work, the society still watches over him, and he is required to report to them every change of residence, the society still lending him material aid and moral support until he has become completely rehabilitated. This system had proved very efficacious, not more than 5 per cent. of those so aided having relapsed into crime. Mr. Robin particularly urged the necessity of the aid societies having free access to the prisoners before their discharge.

Mr. Murray Browne agreed with Mr. Robin that patronage should begin in the prison, and observed that that was practically done in England, since the chaplain was invariably either a member or the secretary of a prisoners' aid society.

A member from France presented an account of the work of the patronage committee of Protestant ladies at Montpellier. This society maintains a home for discharged Protestant female prisoners, where religious instruction is given, and the managers of which endeavor to find situations for those inmates who give satisfactory evidence of reformation. The results were represented as most gratifying.

Dr. Guillaume, of Switzerland, thought that the assistance given to discharged prisoners should be both moral and industrial, and should be given both by the state and by voluntary societies. Nor should the importance of teaching prisoners a trade in prison be overlooked, since

this would be of material assistance to them on discharge. Employment, too, should be provided for them as soon as possible, lest the prisoner, while wandering about in search of work, should lose his desire for it and once more fall into evil ways. The prevalent opinion in Switzerland was that the Crofton system best attained these desired objects.

Mr. Bremner, of England, said that the experience of prisoners' aid societies in that country showed but little success in dealing with female criminals, which he attributed in great measure to the fact that female visitors and agents were not employed. The aid furnished to the societies by the state, too, was inadequate. So important did he consider the work of aiding discharged prisoners that he believed that some plan of moral and material assistance should be embodied in the criminal legislation of a country, to become as definite a part of the general system as are the trial and imprisonment of the offender.

§ 2. *Best means of securing the rehabilitation of prisoners.*—Mr. Stevens, of Belgium, said that the rehabilitation, to be complete, must be both moral and legal. The former was to be obtained by giving each prisoner instruction in the particular religion which he professed. The most perfect religious freedom is preserved in the Belgian prisons, and he earnestly contended for the same freedom in the prisons of all countries. The legal rehabilitation of the prisoner was to be effected, in his judgment, by freeing him from all restrictions, save those to which honest men are subjected. To make the forfeiture of political rights consequent upon imprisonment was to hang a weight around the prisoner who was striving to regain his position. A special patronage might be awarded to convicts whose conduct was good during imprisonment, which should be exercised over women by women and over men by men. He did not favor police supervision of criminals, as practised on the continent, although the friendly supervision contemplated by the Crofton system met with his approval.

Mr. Hastings, of England, said that by act of Parliament any bench of magistrates in charge of a jail might employ, in addition to the regular Protestant chaplain, a Roman Catholic chaplain, and pay his salary out of the funds at their disposal. There was then a bill before Parliament making the employment of such chaplains compulsory.

Sir Walter Crofton said that in all the Irish prisons there were employed, in addition to the chaplain belonging to the Church of England, Roman Catholic and Presbyterian chaplains.

Mrs. Julia Ward Howe, of Boston, thought that in dealing with this question it should be borne in mind that, as Mr. Emerson had said of the death of his child, "perhaps the world, and not the infant, failed." Too frequently the "failure" was rather on the part of society than of the prisoner.

Baron Mackay was not in favor of the rehabilitation of prisoners being effected by a judicial decree. The most perfect religious freedom prevailed in the prisons of Holland and Germany.

Mr. Baker, of England, said that the loss of character suffered by a prisoner in consequence of his incarceration was a wholesome and natural part of his punishment. He maintained that it should not be easy for a liberated convict to obtain attractive and remunerative situations; he ought to begin his new career with a lower kind of work, and rise to higher positions as he showed himself worthy. Supervision, as practised in England, was a powerful instrument in the rehabilitation of the prisoner; it was very rare to find a man under supervision out of work.

Dr. Wines enumerated the civil rights which, in most of the states of

the American Union, were forfeited by a conviction for felony, and explained the "commutation-laws" of his country, under which a convict may shorten his term by good conduct. In several of the states, he said, an irreproachable prison record wrought, of itself, a complete legal rehabilitation of the prisoner, restoring him at once to all his civil rights.

Hon. Mr. Chandler, of Pennsylvania, stated that a conviction for felony in that State did not work a forfeiture of any political rights.

Sir John Pakington, of England, deprecated what he had conceived to be an implication on the part of Mr. Stevens that Roman Catholics were not allowed religious freedom in English prisons. He claimed that the English people were universally opposed to the ignoring of denominational differences among prisoners, and stated that as a member of Parliament he had supported the bill mentioned by Mr. Hastings, requiring county jail authorities to employ Roman Catholic chaplains.*

§ 3. *Best mode of giving remission of sentences and regulating conditional discharges.*—Sir Walter Crofton said that remission of sentences and conditional liberation were now interwoven with the convict-system of the United Kingdom. The maximum remission to convicts sentenced to penal servitude was a fourth of their term, after deducting the nine months spent in solitary confinement. The title of a man to remission of sentence was determined by a system of marks, by which he advanced from class to class, until, according to his deserts as thus indicated, he obtained a partial or entire remission. This system, in effect, amounted to a partial substitution of labor-sentences for time-sentences. Sir Walter defended the system of public-works prisons at some length, saying that they were based on progressive classification, and pointing to the vindication of the Irish system by a recent parliamentary investigating committee, known as Lord Deven's commission. He regarded conditional liberation, combined with registration, as the only reliable mode of testing the value of prison training and of obtaining trustworthy criminal statistics, without which there can be little unity of action. He was of opinion that it was a great protection to society, since it surrounded the commission of crime with obstructions so formidable as to deter habitual offenders.

Mr. Tallack, of England, in reply to Sir Walter's defense of the public-works prisons, defended the cellular system, as approved by the congresses of Utrecht and Frankfort, preventing companionship with evil and allowing abundant communication with good. He called attention to the fact that a few months ago a convict at Spike Island had murdered a fellow-prisoner, and stated that there had been repeated murders at Portland, Chatham, and other public-works prisons.

Mr. Stevens stated that in Belgium conditional liberation was arrived at in another way from that employed in England. Reduction of time was allowed; but as separate detention without possibility of demoralization, and with intercourse with good counselors, was preferred to congregate labor, the reduction depended not so much on a prisoner's conduct as on his having undergone a period of separation proportionate to the sentence. There were certain privileges to be earned by good conduct, however, among which was liberation with curtailment or remission of police supervision. In cases of exemplary conduct and entire reform, the royal prerogative of pardon was exercised. Life-prisoners were kept in cellular confinement for ten years, when, if they were considered worthy of it, conditional liberation was granted them. If un-

* The bill alluded to was withdrawn before the close of the session, owing to a want of time in the House of Commons to discuss it.

worthy they were collected in a common prison, without hope of release. The result of this system was that the proportion of recidivists to those convicted of a first offense was but 4 or 5 per cent.; and the annual number of criminals had declined from 7,000, to 4,000, in spite of increasing population and wealth.

Hon. Joseph R. Chandler, of Pennsylvania, replying to Sir Walter Crofton's defense of the English system of granting "tickets of license," said that in the Eastern penitentiary of his State there were forty convicts who had received these licenses. He was no friend to a system which led men to pretend to be reformed, and declared his decided preference for the cellular over the Crofton system. He denied that that system was "solitary," and avowed that the only solitude it involved was a solitude as to demoralizing influences. Besides which it saved a man who was trying to lead a new life from being taunted by a former fellow-prisoner with being an *ex-convict*, thus often bringing upon him unmerited suspicion.

Mr. Frederic Hill regretted to hear of the invasion of Pennsylvania by ticket-of-leave men; but by way of explanation stated that the system, as formerly administered, did not, as now, make liberation depend upon good conduct; and he thought that the men mentioned by Mr. Chandler must have been liberated under the discarded system. As an inspector of prisons, he had at first favored the cellular system, but experience had weaned him from it. Mere isolation, while excellent as a part of a system, was not a system *per se*. Under the separate system, the absence of temptation rendered it difficult to test reformation.

Major Du Cane, chairman of the directors of English convict-prisons, said that in these institutions a prisoner was obliged to effect his discharge by his industry. The maximum remission of sentence was one-fourth of the time remaining after serving out his nine months of separate confinement. Great precautions were taken to insure the remission being justly awarded. When conditionally liberated, a prisoner was under the supervision of the police, to whom he was obliged to report himself. If he gave evidence of going astray, the police might take him before a magistrate, and on proof of his misconduct he was sent back to prison.

Mr. Nevin, one of the directors of the western penitentiary of Pennsylvania, gave an account of the change made in that prison from the cellular to the congregate system, which, he said, had been attended with great benefit.

Dr. Frey, of Austria, said that in that country cellular imprisonment was limited to three years; after that portion of his sentence had expired, a prisoner was placed under the congregate system. For himself, he favored such a combination of the two systems. A prisoner should mingle with his fellow-convicts, so as to become prepared for re-entering society, since, if kept entirely in solitary confinement, he would not be likely to withstand temptation on his release.

Mr. Hastings, of England, remarked that keeping a prisoner apart was like keeping the hand on a spring; the moment you lifted your hand, it flew up. When a man thus treated was discharged, the change was so great that he was almost certain to fall back into his original habits. He should be educated for liberation, after passing through the cellular stage, by associating with his fellow-criminals; and next by going to an intermediate prison, where he had much greater liberty, and where a further test was applied. If he still went on well, and gradually acquired habits of industry and fitness for liberty, he passed into the further stage of liberation under supervision.

§ 4. *Supervision of discharged convicts.*—Mr. Baker, of England, opened the discussion by explaining the law of England on this subject. Under that law, a person convicted a second time of felony may be condemned, in addition to imprisonment, to police supervision for a period not exceeding seven years. He must, at the end of each month, report himself and give an account of his conduct either to the police or some person authorized to receive his report. He must give notice of a change of residence to the police of the district which he leaves and of that to which he goes. The police, as long as he complies with the law, always prove his friends, assisting him in finding work and giving him, in case of need, money furnished by the prisoners' aid societies. This system, Mr. Baker contended, was kind to the supervised, offering him complete liberty as long as he conducted well, and exercising over him that friendly guardianship so useful to persons of infirm moral character. Moreover, it seemed to the public a protection of seven years instead of one, and allowed the term of imprisonment to be shortened by one-half, thus saving one-half the total cost of his expenses.

Mr. F. Hill remarked that Rev. Mr. Clay organized supervision in Lancashire years before Parliament adopted it. He found it caused a diminution of crime and was beneficial to the prisoners, the police helping them to obtain work.

Mr. Murray Browne said it was sometimes alleged that the police supervision would prevent prisoners getting work, but prisoners' aid societies knew that this was not the case. Last year, on the home secretary taking their opinion, thirteen societies out of sixteen were favorable to the system.

Mr. Stevens contended that, in countries where an organized police existed, discharged prisoners should be under no more supervision than other citizens. In Belgium a man might be sent by the police to a small place, not being permitted to go to large communities, but he might not find work there, and would be, in consequence, likely to relapse.

CHAPTER XX.

MISCELLANEOUS POINTS.

§ 1. *Whether prison officers need special training for their work.*—Dr. Guillaume, of Switzerland, opened the discussion, maintaining the affirmative of the question. He laid down the positions that it is for the interest of society that criminals should be reformed, and that they will become good only when unceasingly surrounded by good influences. From these premises he argued that the inferior as well as the higher officers of a prison should be acquainted with the moral and pedagogic means of penitentiary treatment, which acquaintance involved a recognition of the principle that a special education of prison officers is necessary and indispensable. It was for each country to determine whether it is desirable to establish normal schools for this purpose, or whether the employés should pass a preparatory training in a prison, or receive a course of periodical theoretic teaching. Speaking for himself, he wished the school for training prison officers to be in connection with a prison. Having selected men of ordinary intelligence, command of temper, &c., they should be put into the training prison to learn their work, after which they should be promoted according to merit, until,

possibly, they reached the top. These remarks did not apply to the governors or wardens of prisons, who should possess superior qualifications, and be endowed with a kind heart, sound judgment, general knowledge, and good temper. In conclusion, Dr. Guillaume said that he might summarize his views on this topic in the resolution adopted by the Prison Congress of Cincinnati in 1870, viz :

Special training, as well as high qualities of head and heart, is required to make a good prison or reformatory officer. The administration of public punishment will not become scientific, uniform, and successful until it is raised to the dignity of a profession, and men are specially trained for it as they are for other pursuits.

Major Du Cane, director of English convict-prisons, thought that prison officers, like physicians and soldiers, should learn their duty from actual experience. No preliminary instruction could be as valuable as seeing the supervision of skilled officials in actual practice. He believed that the tone of the English prison officials was all that it should be. A moderate amount of intelligence and education was required, and due care was taken to secure these qualifications, as well as firmness, honesty, and good temper. It was expected of them to convince the prisoners that society was not their enemy, but only wished to show them the way of well-doing. He believed that the prison officials in England did their duty efficiently, and that when recruits entered such a body they entered the best school in which to learn their duties.

Baron Mackay, of Holland, said that Dutch legislation discouraged technical education, believing that better material was found in a man with a general education than in one trained *ad hoc*. In the cellular prison at Amsterdam (the largest in Holland) it had not been found necessary to employ specially-trained officers. He agreed with Dr. Guillaume that training was desirable if it could be obtained within the prison-walls; but he objected to a normal school outside the prison for the inculcation of theories. He favored the promotion of subalterns, so trained, as vacancies occurred in the prison staff.

Sir Harry Verney, M. P., while not doubting that persons taken from the intelligent classes might make good prison officers, was, nevertheless, of the opinion that persons specially trained to the work would be more efficient. It had occurred to him, Why should not prison governors be selected from the subaltern officials? In England they were taken from the army and navy; but it might, perhaps, be better to advance prison officers. Many years ago, while visiting Dr. Wichern, at the Rauhe Haus, near Hamburg, he had seen there a number of young men being educated to take the place of officers in the prisons at Berlin. The idea struck him favorably at the time, and subsequent reflection had confirmed him in his opinion.

Mr. Rathbone, of England, pointed out an objection to the promotion of subalterns to the highest offices, viz, that the salaries now given did not attract men of education to these posts. A governor needed quick perception of character and great firmness—qualities, in his opinion, not specially cultivated by prison life.

Major Fulford, governor of Stafford jail, England, thought it would be absurd to have a normal school for subordinate officers. At his jail, such officers were always taken on probation, and, if found incompetent, were dismissed.

Dr. Mouat, of England, thought that, what the hospital and dissecting-room were to the surgeon, the prison was to officials. Intelligence and good moral character were indispensable, but it was in practical experience that they must learn their work. As to prison governors, he thought that, other things being equal, men should be selected who

were gentlemen and men of education in the broadest sense of the words. A prison was a moral hospital, which required a large amount of knowledge of mental phenomena, of religion, and education, and high aims in reclaiming the idle and vicious. Some special training was therefore advisable for both subordinate and superior officers.

Dr. Wines said that M. Demetz, the founder of the reformatory at Mettray, was so convinced of the necessity of a special training for those intrusted with the care of criminal men and boys that he had established a preparatory school, and spent an entire year with his colleagues in training twelve or fifteen young men as officers before he admitted a single inmate. The school had been kept up ever since, with twenty-five to thirty young men constantly in attendance, having a three years' course of training, and M. Demetz was strongly of opinion that Mettray would not have succeeded without it. The success of this reformatory probably surpassed that of any other institution in the world, scarcely 5 per cent. of those who left it ever returning to a career of crime.

§ 2. *Whether transportation is admissible and expedient in punishment of crime.*—Count de Foresta, of Italy, in opening the discussion, said that transportation, as carried on in France—transportation with compulsory labor in a colony—he approved of as the best punishment for great criminals, believing that it answered perfectly the double object of all punishment, viz, the protection of society within the limits of justice, and the reformation or amendment of the convict. It protects society by casting out from its bosom the most dangerous criminals, avoiding the grave inconveniences of relapses, and deterring would-be criminals by the prospect of banishment from their country and family. It encourages the convict by giving him a hope of becoming again useful to society and beginning a new life far from his old haunts, whither he may bring his family, or, if he have none, may found a new one. While thus approving of the main features of the French, as distinguished from the English, system of transportation, the count pointed out the defects of the latter and criticised them severely.

Mr. Pols, of Holland, thought that to send convicts to another country was unfair. If sent to a new colony, the natives were doomed to extermination. If the convicts were colonized, their descendants would, as in the English colonies, object to receive them, and the system would again have to be changed. Transportation for any length of time was impracticable.

Count Sollobub, of Russia, thought that transportation might be beneficial if a locality were selected which needed colonization and cultivation and external aid for the development of its resources.

Mr. Hastings, of England, remarked that to send convicts to an inhabited country was to wrong its citizens, who would, when they were able, resist it. To send them to an uninhabited country was merely to send them to a prison ten thousand or twelve thousand miles off, far removed from public supervision, a system always liable to great abuse. Moreover, the cost of the support of the convict was as great or greater as at home, and the expense of the voyage had to be incurred in addition.

Count de Foresta, in reply, said that he totally disapproved of transportation as formerly practised under the English law. He advocated sending convicts under life or fifteen or twenty year sentences to distant and, if possible, uninhabited regions, with separation at night and compulsory labor. When such colonies ultimately refused to receive convicts, (as the Australian colonies had,) it would be time enough to consider what should be done.

Baron von Holtzendorff thought that the experience of England was strongly against transportation, but that the question should be left open to the decision of countries that believed themselves to be placed under better conditions than England.

§ 3. *Whether short imprisonments and the non-payment of fines may be replaced by compulsory labor without privation of liberty.*—Count de Foresta, of Italy, explained to the congress a plan for effecting the end proposed in the title of the present section. He pointed out the evils attendant upon the imposing of sentences too short to admit of instruction or reformation, yet long enough to allow of the prisoner becoming morally corrupted. He believed that these evils might be diminished, if not entirely removed, by substituting for imprisonment obligatory labor during the day, leaving the condemned free to return to their families in the evening, like ordinary laborers. Again, as regards the payment of fines, since labor is the poor man's capital, the count urged that it would be more logical for society to re-imburse itself by means of his labor than to fling him into a cell, where he produced nothing. He admitted that this plan would prove difficult in execution, but denied that it was impracticable, and instanced many ways in which the condemned might be employed. He thought the system could be made applicable, especially in localities where there were large barren tracts to be reclaimed, or roads to be constructed.

Mr. Tallack, of England, remarked that the treatment of vagrants in that country was analogous to that proposed by Count de Foresta for petty offenders, which he approved, and would be glad to see adopted. It would prove beneficial to the offender himself in many instances, and the worst portion of the community would be deterred without breaking up homes and ruining families.

Rev. Mr. Collins, of England, favored the plan proposed by Count de Foresta. He had seen the agony caused in a respectable family by its principal member being committed to prison and branded as a jail-bird. Imprisonment should be made an object of dread, by surrounding it with disgrace and resorting to it as seldom as possible. He had long had misgivings, as a magistrate, whether he had not helped men to become criminals, rather than deterred them, by the imperative way in which the law required him to substitute short imprisonments for fines. By sending men to prison for a mere trivial offense, the feeling of shame was broken down, whereas self-respect should be maintained.

Mr. Stevens, of Belgium, thought that practically there would be found inconveniences in the system. Some prisoners were unaccustomed to manual labor. Again, how could employment be found for painters, musicians, &c.? Work in public would lack the penal element necessary in prison discipline, even for trifling offenses, and there would be some danger in collecting a dangerous class of men together, without the privation of liberty. He preferred to shut men up and subject them to moral influence.

Sir John Bowring considered the plan entirely feasible, if the condition of individual offenders and the circumstances of the locality were taken into account. In an agricultural district the men might be employed in agriculture, while in town they would be accustomed to various trades, which might be carried on by them. He once found a locksmith in a solitary cell earning seven shillings a day.

Baron Mackay, of Holland, regarded the proposal as chimerical. If the condemned received less than his wonted compensation, the punishment fell more heavily on his family than on himself. If, on the other hand, he received full pay, the only change in his mode of life being

working in one place instead of another, where would be the punishment? It would be a punishment only for those unaccustomed to manual labor, to whom it would be an aggravation rather than an alleviation, while, in such cases, mere intellectual work, if allowed, would be too slight a punishment.

Mr. Bremner, an English magistrate, thought the imposition of fines a very unequal punishment, and believed that, in case of inability to pay a fine, justice demanded some other alternative than imprisonment.

Baron von Holtzendorff would point to Prussia as a proof of the feasibility of the scheme. For twenty years there had existed a law providing labor as a substitute for a fine in the case of offenses against the forest-laws and wood-stealing.

§ 4. *The proper limits of the power of boards of prison managers as regards the administration of prisons.*—M. Loyson, of France, said that, in his country, there were regularly-appointed commissioners of supervision, whose functions were carefully defined. Their special mission consisted in promoting the moral and religious reformation of the convicts. The commissioners and the prison governors were entirely independent of each other. If the former perceived anything requiring correction, they notified the director, and, in case he refused to interfere, they might appeal to the prefect of the department or to the minister of the interior. Their services were entirely gratuitous, and they were generally chosen from the leading inhabitants of the district. He believed that this system, as a whole, offered advantages which no other could, since the daily visits of local commissioners were better than the occasional visits of inspectors.

M. Vaucher-Crémieux, of Switzerland, said that in that country the grand council of the canton appointed a commission, which was unconnected with the prison authorities and which might visit the prison at their discretion. They could point out defects and suggest remedies, but had no executive power.

Colonel Ratcliff, of England, said that the visiting justices in each county saw that the law was properly administered, while the government sent down an inspector yearly to examine all the details of administration.

§ 5. *Whether the government of prisons should be placed in the hands of one supreme central authority.*—Mr. Hastings, of England, thought that the plan adopted in that country, of having the county jails entirely distinct from the higher grade of prisons—the former being under the control of the local authorities, the latter under that of the general government—was preferable to a uniform system, under which all penal institutions should be subject to one central authority. Such a system, while it would undoubtedly have its advantages, would be apt to become stereotyped. He doubted whether it could be authoritatively declared that any one system was so far superior to all others that it ought to be enforced everywhere. A variety of details and an interchange of opinions and experiences would probably pave the way for a better system than any which could be theoretically devised.

Mr. Ploos van Amstel said that in Holland the minister of justice was chief administrator of prisons. A change of ministry, which was not infrequent, always involved the possibility of changes in prison management. To secure permanence, he thought that a council of three or four members should act with the minister. Local boards, nominated by the government, were charged with the interior administration or supervision of the prisons in every locality.

Mr. Stevens, of Belgium, admitted that political decentralization had

its advantages, but questioned whether this was the case with administrative decentralization. In Belgium, all prisons were under a uniform system. If a local commission suggested an improvement, it was considered by the central authority, and, if approved, was introduced in all prisons. Punishment as well as law surely ought to be uniform.

Dr. Guillaume, of Switzerland, said that each of the twenty-five Swiss cantons had its own legislature and administration, thus preventing any uniformity. He believed, however, that a central authority (he would say the minister of the interior) should have the direction of prisons, refuges, and similar institutions having a preventive or other effect on crime.

Messrs. Carter and Baker, of England, warmly defended the English system of local management for local prisons. County magistrates, in their opinion, were better acquainted with the feelings of the people, and could therefore manage the jails better than a central authority.

§ 6. *International prison statistics.*—Mr. Beltrani-Scalia, of Italy, said that it was needless to show the utility of penitentiary statistics, which alone could furnish legislators with the elements necessary for a reform of the penal system, and which, moreover, would furnish judges with valuable hints in the application of punishment. He deplored the want of success which had attended the recommendations and efforts put forth in this direction by the prison congresses of 1858 and 1863, and by the statistical congresses of 1857, 1860, and 1870. He thought that an international commission ought to be appointed, comprising representatives of the different countries, which would lay down the basis of international prison statistics, leaving each government free to determine the form and time of the official publications it considered useful. The statistical congress at the Hague, in 1870, had expressed a wish that the tables be prepared, not only in the language of the country, but also in French. He regarded the suggestion as a good one.

Count Sollohub, of Russia, considered the suggestion of Mr. Beltrani-Scalia with regard to an international commission not only wise, but feasible. He felt sure no country would refuse to co-operate.

Dr. Frey, of Austria, thought that a comparison between different countries would be attended with some difficulty, though he hoped not insuperable. A different percentage, under different systems might be due to nationality, not to system. Thus, if the question arose how many persons suffered from lunacy under isolated and how many under congregate imprisonment, the percentage of lunacy in the country should be considered. So with regard to the rate of mortality in prisons.

Dr. Guillaume, of Switzerland, urged the importance of criminal statistics as a guide to prison-reformers. Minute information should be obtained of the criminal, so that the springs of crime might be ascertained and dried up.

Professor Leone Levi, of England, proposed that an international commission be appointed by this congress to lay down the principles of a yearly statistical report on crime and prison discipline. Uniformity of nomenclature of crime was indispensable in order to ascertain its increase or decrease. What was murder in one country was not murder in another. A system should be devised that would guard against ambiguity in this regard.

§ 7. *The best means of repressing criminal capitalists.*—Mr. Edwin Hill, of England, began the discussion by reading a paper on this subject. He thought that the public mind was at fault in not having, as yet, grasped the important truth that crime on a large scale is a craft, so far organized as to require the co-operation of labor and capital for

its successful operation. These "criminal capitalists" he divided into four classes, viz: 1, the providers of homes for the predatory classes—*i. e.*, owners of real property occupied by thieves; 2, keepers of "flash-houses," or establishments wherein thieves meet for purposes of carousal and to plot the crimes they intend to perpetrate; 3, booty-mongers, or receivers of stolen property, called, in thieves' slang, "fences;" and, 4, the inventors and manufacturers of burglarious implements. He believed and knew that so dependent were thieves upon these four classes of capitalists, if the supporting capital were withdrawn, thieving, as a vocation, must cease. He instanced two distressing evils which, in such case, could not fail to be suppressed, viz, first, the birth and nurture of children so environed by criminality as to have, practically, no means of escape; and, secondly, the street-corruption of honest men's children by evil associations and the enticement to pilfer now offered by the purchasers of petty pilferings. He admitted that organized criminality would cease as entirely, could the mere operative thieves all be driven from the field, but urged that the want of success that has so far attended the vast efforts put forth and the enormous expense incurred by society in seeking to effect this was an argument to try the plan that he had suggested, which he considered much more certain, far less expensive, and equally effectual. He pointed out what he considered to be numerous defects in the existing English law on this subject, and suggested changes for the purpose of, first, effectually deterring the owners of real property from suffering it to become a refuge for criminals; and, secondly, to render the conviction of receivers of stolen property more easy than it now is. He also urged the justice of heavily mulcting all capital found aiding the operations of criminals to defray the enormous expense of police, prisons, &c.

Mr. Serjeant Cox, of England, said that in that country a law had been recently passed increasing the minimum quantity which a marine-store keeper or junk-dealer was allowed to purchase, this class of dealers being usually encouragers of petty pilfering by purchasing the stolen bits of iron, old rope, and other articles purloined by children. The effect of this law had been to materially reduce the number of such crimes, and he believed if its principle were extended to other articles, and shop-keepers were prohibited purchasing from children under a certain age any commodities which they were not likely to have acquired rightfully, and restrictions were placed upon the hours during which marine-store dealers might be dealt with, very much good would probably ensue. In the court over which he presided he had made it a principle always to give the receiver double the punishment inflicted on the thief. If this rule were universally carried out, receiving would be regarded as a much more dangerous employment, and the limitation of the number would increase the check we could keep on those that remained.

Hon. J. R. Chandler, of Pennsylvania, stated the law in America on this subject to be that the owner of stolen property could always compel the party in whose possession it was found to account for the manner in which it came into his possession, and that a house wherein trade in stolen goods was carried on could be dealt with as a "disorderly house." As to that class of capitalists who amassed wealth out of the ruin of one sex, he considered hanging their merited punishment.

Colonel Ratcliff, of England, thought it impracticable to require the inspectors of houses to close those buildings wherein known thieves lived. He said that it was often an advantage to the police to know

the houses in which thieves congregated, since it enabled them more readily to find men of whom they were in search.

Mr. Aspinall, of England, thought that an incorrect impression might be derived from Mr. Hill's statement as to the difficulty of convicting receivers under the English law, which was very much the same as Mr. Chandler had stated to be the law of his country. It would be an encroachment on the liberty of the subject to allow private houses to be searched without special warrant, but all public houses were open to police visitation at any moment. All junk-dealers were required to take out a license, and to enter in a book, subject to police inspection, every transaction in metals and that sort of property which children were tempted to steal, from the facility with which it could be turned into money. Besides which, it was not uncommon in his own city (Liverpool) for the magistrates to punish the receiver seven times as much as the thief. He made these statements, fearing that strangers might receive an exaggerated idea of the defects of the English law in this particular from Mr. Edwin Hill's paper.

§ 8. *Whether whipping is expedient as a punishment for crime.*—Mr. Pols, of Holland, said that, not out of sympathy with ruffians, but with honest people, he urged the abolition of bodily inflictions in punishment of crime, which he considered wholly inefficient as a means of social defense, engendering cruelty, and being far more injurious to society, which imposed it, than to the criminal, who suffered it. In inflicting punishment regard should always be had to its probable reformatory results. The criminal's moral and religious feelings should be respected and fostered, a love of order and of labor implanted, his sense of responsibility and his power of self-restraint increased. To effect this, we must reach the understanding, the way to which was not through the lash. He did not believe that there were any criminals so hardened that this faculty could not be reached through moral suasion; while violence bred violence, harshness engendered hatred, hardness excited to revolt. In Holland, flogging had been prohibited in the school and the prison, and expunged from the penal code. In each instance, its abolition had resulted in a diminution of the offenses for which, previously, it had been inflicted. In the army, although not formally abolished, it had been practically discontinued for forty years, during which time insubordination had steadily decreased. He had no hesitation in attributing to the abolition of corporal punishment no small share of the happiness of Holland, and what was true of Holland he believed to be true of other continental states.

Mr. Aspinall, of England, observed that apparent was not always real philanthropy, and that, while regarding the reformatory element of punishment, that which was deterrent should not be overlooked. He was for resorting to corporal punishment where every other agency failed. Wife and women beaters deserved the lash, and in the majority of cases no other punishment had any effect. Could any one see the blackened eyes, discolored flesh, and crippled forms of wretched women and children, he would say that the monsters who produced these deserved corporal punishment.

Colonel Ratcliff, of England, thought that there was a certain class of men who were susceptible to no other influence. That it was efficacious he maintained was proved by the fact that, immediately after the passage of the act visiting garroters with corporal punishment, robberies with violence were no more heard of.

Dr. Marquardsen, of Bavaria, remarked that public opinion in Eng-

land had been unduly influenced by the garroting panic, but for which it would have kept pace with that of the continent on this question.

§ 9. *Extradition treaties.*—Dr. Frey, of Austria, introduced this question, maintaining that the negotiation of treaties between civilized states for the extradition of criminals ought not to be influenced by political considerations. There could be no doubt, he said, that the absence of such treaties constituted a temptation to criminals, who knew that they could commit a crime, and afterward enjoy immunity from arrest in a neighboring state. Such treaties were, therefore, of vital importance.

No discussion followed Dr. Frey's remarks.

§ 10. *Woman's work in prisons.*—Mrs. Chase, of Rhode Island, opened the discussion on this question by alluding to the efforts that have recently been made in several of the States in her country to secure the appointment of women on the boards of state-prison inspectors. She said that those who urged this measure based their claim primarily on the ground that it is the *duty* of women to share with men in the care, instruction, and reformation of criminals, and that they can best do so if empowered with the same authority. Criminal women especially need the sympathy and society of their own sex; and the women who are usually employed in the capacity of prison matrons are not, she thought, generally capable of comprehending the peculiar condition of these unfortunates, which, on several accounts, is more deplorable than that of criminal men. Nor, in her opinion, was the evil remedied by volunteer visitation of prisons by women. While much may be accomplished through this means, still a woman who feels that she is so employed by permission only cannot fail to be greatly embarrassed; and, if she call attention to any abuse, her criticism is regarded as unwarrantable interference, and often leads to her exclusion. She also called attention to the softening influence that good women might reasonably be expected to exert over male criminals separated, in many cases, from their families and removed from all home associations. Again, the counsels of women in the board of inspectors would be valuable in all matters pertaining to the domestic economy of prison. As a member of the legally-constituted board of female visitors of the Rhode Island state-prison, she knew that the attention of the inspectors was mainly given to the men. As the chairman of the board of inspectors had said to her, "We cannot go into the women's hospital, and we know nothing about it." This inattention, which she believed to be general throughout the country, she attributed to three causes: first, the comparatively small number of women in prison made it seem less important that they should be looked after; secondly, good men regard a fallen woman as so much worse than a fallen man that they involuntarily shrink from association with her; and, thirdly, the public sentiment that regards fallen women as hopelessly lost follows them within the prison-walls, and the inspectors feel that they cannot hold out to them the same hopes as to men. An inspector had once said to her, "We don't know what to say to them." She believed that if there was anything to say to them, if in any way the path to a life of virtue could be opened to them, if the stone which an unjust public sentiment had laid over the grave of their respectability *could* be rolled away, it must be done by women, and from her own experience she knew that, to do this thoroughly and well, women must share with men the responsibility and authority which guide and control these institutions.

Miss Mary Carpenter, of England, was not one of those who desired that woman should take the place of man or do man's work, but she wished to define what, in her judgment, was the special work of women

in connection with prisons. She believed that everything which concerned the reformation of female convicts should be solely, and the reformation of children partly, under the care of women. Children requiring reformation should be placed in homes, not in prisons; and there can be no true home without a mother, or a sister, or some woman to control it. Ladies ought to conduct and manage reformatory schools for girls. She admitted that a majority of women were incapable of managing business arrangements in a board, but thought that they might be trained to it. It was also very important that the higher influence of educated women, when combined with an earnest, philanthropic, and religious spirit, should be brought to bear upon female convicts. She was aware of the great difficulties attending the visitation of prisons by women, but they had been triumphantly surmounted in the convict-prisons of Ireland, where ladies of approved position and character were permitted to visit the inmates, each lady confining herself exclusively to the denomination of female convicts to which she belonged. This system had worked admirably. She agreed with Mrs. Chase that lady visitors ought to have an official position. It was, however, when a woman had left prison that the good offices of her own sex were especially required. She would give to ladies such a part in the reformation of convicts out of prison as was done at Golden Bridge, in Ireland, in the institution which Sir Walter Crofton established. In that country, where the majority were Roman Catholics, the gentleman named had requested the nuns of the Golden Bridge Convent to take charge of female prisoners before their terms of sentence had expired, the institution receiving an allowance for their maintenance from the prison authorities. If their conduct while there is bad, they are remitted to prison; if good, families were found in abundance willing to take them into their homes. So successful had this system proved, that out of the thousands of cases that had passed through it, there had been very few relapses. Sir Walter Crofton had, after great effort, obtained permission of the government to try it in England. This he had done on a small scale, and with like success. The institution had been entirely under the control and management of women, though of course there had been, behind their authority, legal power to direct.

Miss Emily Faithful, of England, desired to bear her testimony to the great value of the institution to which Miss Carpenter had referred as having been founded by Sir Walter Crofton in England, and thought it very desirable that such establishments should exist in every part of the country, since it was of vital importance to a discharged female prisoner that an opportunity of leading a better life should be afforded her. But for families to receive these women promiscuously into their homes, immediately upon their release, would be productive of more harm than good. She deeply felt the necessity for the appointment of lady-visitors, but thought that women should be specially trained for this work.

Mrs. Julia Ward Howe, of America, thought that, if it were well to have female physicians in certain cases of bodily disease, it was equally important that some of the doctors of crime should be women. She believed that women themselves and society at large were both at fault in this matter.

Mrs. Lewis, of England, spoke of her first visit to the large female prison at Fulham. A lady-visitor had not been seen for months, and the cheering influence produced by her visit, alike upon officials and inmates, was plainly perceptible. The inference that she drew was that lady-visitors could not be too often admitted to these establishments.

Mr. Bremner, of England, said that only women could approach the better feelings of fallen women, and he thought that the non-recognition of this principle by prison managers was a grave mistake. He believed that lady-visitors should have an official position in female prisons, which would free them from the charge of meddlesome interference. As a proof of the inability of men to supply the place of women in this work, he remarked that the Prisoners' Aid Society of Manchester had failed so entirely in its work among liberated female convicts that it had abandoned it altogether.

Rev. Mr. Crombleholme, of England, had, as a manager of an industrial school for boys, felt the necessity of having a good woman to deal with them. A large proportion of children born in prisons and work-houses, or sent to work-houses, died before reaching the age of seven years, for want of a woman's motherly care. He believed, moreover, that it was impossible to reform women except through female agency. He believed that an official board of lady-visitors should be attached to every prison.

Lady Bowring spoke of the peculiar difficulties that beset fallen women on attempting to reform their lives, and urged the appointment of an official board of ladies in connection with each female prison, who might awaken a desire in their breasts to lead a better life, and might render such an end more easily accomplished.

CHAPTER XXI.

PREVENTIVE AND REFORMATORY WORK.

Rev. Charles L. Brace, secretary of the New York Children's Aid Society, introduced the discussion of this topic in a long, able, and interesting paper on the prevention of juvenile crime in large cities. He believed that the greatest danger to both property and life in large cities was from the class of ignorant, neglected, and outcast youth, the fearful increase of whose criminal precocity could be checked only by organization and combination. The task, even under the most favorable conditions, is one requiring great skill, judgment, and perseverance. The first influence needed is sympathy. The great majority of these outcasts cannot believe that any one cares for them. This solitude is what especially drives a girl to despair and ruin. When these children begin to learn that those more fortunate in life have a sincere sympathy for them, half the danger has passed away; they become susceptible to reforming influences and are less exposed to temptations to vice and crime. The second influence indispensable to the successful prosecution of this work is education, or school-training, which inculcates habits of steady labor, punctuality, and exactness, and a taste for knowledge, besides enabling the youth to earn his bread. To make education, however, universal, it should be gratuitous and compulsory. Together with school-training naturally comes discipline, invaluable to these street-wanderers, unaccustomed as they are to self-control and submission to law. But, in teaching them discipline, their independence and self-help, so far from being checked, should be encouraged. Industrial training, also, should be imparted to these children. It is not desirable, however, to attempt self-supporting industrial movements among them, but rather to fit them for any occupation by teaching habits of industry. Religion is an indispensable element in any combination of influences designed

to effect a saving work among these juvenile vagrants. Nothing else can strengthen them against the tide of evil influences in which they are placed. Mr. Brace further mentioned, as the final and best practical agency in efforts in large towns for this class, the plan of "placing out," or emigration to country districts. This breaks up all the worst associations about these unfortunate youths, takes them from their companions and haunts of vice, puts them where others will respect them if they respect themselves, gives them the best of all labors for "minds diseased"—labor on the soil—opens to them a chance of success and competency, and places them in the most useful class in every country, the tillers of the ground. Besides the advantages here indicated, this plan commends itself on the score of economy, the expense of "placing out" being a bagatelle compared to that of a public institution, such as an alms-house, asylum, or reformatory for an equal number. It relieves the community of paupers and future criminals, and destroys hereditary pauperism. Mr. Brace then gave an extended account of the formation and work of the New York Children's Aid Society, whose chief agency he stated to be "placing out" these children in country homes in the Western States, which has been, in his opinion, an unmingled blessing, and the most economical charity ever devised. The number of children thus sent West since the formation of the society has been 22,000, of whom comparatively few drift back to the city.

Miss Mary Carpenter, the manager and founder of the Red Lodge Reformatory for Girls, Bristol, England, continued the discussion by the reading of a most valuable paper on "The Principles and Results of the English Reformatory and Certified Industrial Schools." The system on which these schools are conducted has been already so fully explained in Part First of this report, that but a brief *résumé* of the main points in the very interesting paper by Miss Carpenter will be attempted here. The difference between the two classes of institutions mentioned in the title of the paper lies in the fact that to the former may be committed for a certain number of years children guilty of any act punishable with not less than fourteen days' previous imprisonment, while the latter are intended for young persons in a state of *proclivity* to crime. Both classes of schools must be established by private benevolence, but must be inspected by some one appointed by the secretary of state, and if he *certify* them as fit and proper for the purpose, the state grants a fixed sum per capita for each child sentenced to the school as long as he remains an inmate. This allowance is smaller in the case of industrial schools. A number of small institutions have been found better than a few large central ones. In order that a home feeling may be inspired, each school should be adapted to receive only fifty or sixty inmates; if any institutions contain a larger number, they are divided into several schools, each of which occupies a separate house. In the general training, industrial, and if possible, out-door employment occupies a prominent part, the girls being taught such occupations as will prepare them for domestic life. At least three hours daily are devoted to religious instruction and the ordinary branches of education. Sufficient time is allowed for recreation and occasional innocent gratification. The food, clothing, and surroundings in reformatories are such as are adapted to working boys and girls, and conduce to their health and civilization, without giving them undue indulgence. The results of this system Miss Carpenter described as most encouraging. As an illustration, she mentioned that, of seventy girls discharged from her own reformatory during four years, only one was reconvicted during that period, nine others were doubtful or unknown, and sixty were maintaining themselves re-

spectably, six of them having been well married. But independent of any isolated facts or any statistics, Miss Carpenter stated that juvenile crime, as it existed twenty years ago, has been *absolutely annihilated*. At the outset of this reformatory work, young persons were frequently committed who had been in prison six or eight times; at present, cases of even a second conviction are uncommon. So satisfactory have been its results, that children who have passed through a reformatory are sought for, even in preference to others, as being better prepared for work than ordinary children. And as a final result of the reformatory work thus described, Miss Carpenter stated that the public interest had been awakened in these outcast children, and that it is now well understood that, in this matter at least, sound political economy and true Christianity are not really at variance, and the heart and conscience of the nation have been opened to bestow money and effort, as well as love and sympathy, to save these young ones.

Mr. J. A. Foote, of Ohio, briefly noticed the success that had attended the work of the Ohio Reform School, and said that reformatory work was the romance of doing good.

Mr. Vaucher-Crémieux, of Switzerland, thought that in the reformation of juvenile offenders the germ of crime was destroyed. He particularly favored agricultural colonies like Mettray, where, out of four thousand inmates, it was believed that there were scarcely a score who had not been completely regenerated.

Mr. Hendrickson, of Wisconsin, described the school of which he is the superintendent, which is conducted on what is known as the family plan, and which had been remarkably successful.

Mr. Howe, superintendent of the Ohio Reform Farm School, gave an interesting sketch of the organization, growth, and complete success of that institution.

Mr. Bournat, of France, said that in that country there were two classes of reformatories, called, respectively, penitentiary and correctional colonies. To the former were sent young offenders sentenced to less than two years' imprisonment, as well as orphans under sixteen who were judged not to have erred knowingly; to the latter were sent those sentenced for more than two years and those guilty of insubordination in the penitentiary colonies. The cellular prison of La Petite Roquette, Paris, received minors under sixteen. If their conduct in the penitentiary was good, they were surrendered to the patronage society for liberated juveniles of the Seine, which apprenticed them to a trade. If their conduct gave satisfaction to their masters, they were not interfered with; if otherwise, they were sent back to the penitentiary.

Mr. Marshall, of England, described the boys' reformatory at Feltham and that for girls at Hampstead. In the former, boys were instructed in practical seamanship, and were often well received by captains when applying for positions on ship-board on discharge. At the latter, the inmates were trained for domestic service, and situations were readily obtained for them on liberation. At both, scholastic and religious educations were imparted with assiduity and success.

Sir T. Fowell Buxton, of England, said that in that country it was seldom possible to reduce the average retention of juvenile delinquents to less than twelve or eighteen months. The facilities for "placing out" children, as described by Mr. Brace, were not so good in England as in America, owing to the greater density of the population.

Mr. Baker, of England, as one of the pioneer founders of reformatory schools, recounted the difficulties that had attended their formation. In 1856 Parliament passed laws enabling reformatories to spring up all

over the country, the result being that in four years the number of commitments of juveniles had been reduced from 14,000 to 8,000.

Baron von Holtzendorff, of Prussia, said that compulsory education was one of the preventive measures adopted in Germany, and that, owing to this, such spectacles as met the eye in London were never seen in Berlin. Children under twelve were not brought before a magistrate, but punished by the school-master. Between the ages of twelve and eighteen, they might be sent to reformatories, which were generally under the management of private persons, and where they might be detained until they reached the age of twenty. He was of opinion that the progressive treatment might be applied to juvenile delinquents. The prevailing opinion in Germany was that it was not sufficient merely to detain a child to the age of thirteen or fourteen at a public school, but that there should be a complementary course to the age of eighteen, and that boys and girls who had left school ought to be obliged to attend evening lectures twice a week. This was thought desirable because the period he had mentioned was a very dangerous one. Such a complementary course was believed to be of much importance, and some such provision had been already made in Saxony. The subject was now occupying the attention of the Prussian government.

Dr. Guillaume, of Switzerland, thought education in infancy was the best preventive of crime, a predisposition to which he believed was sometimes hereditary. Neglected children were not responsible for their moral infirmities. To place such children in charitable, Christian homes he considered better than sending them to reformatories. Since in Switzerland a sufficient number of such families could not be found, institutions to the number of seventy or eighty had been established to care for these children. They were so organized as to resemble a family as much as possible. Not more than 10 or 15 per cent. of the inmates turned out badly. The rest became good citizens in after-life, marrying and themselves founding new homes.

Mr. Wills, of England, had once seen gardens allotted to fifty of the best boys in a reformatory having two hundred inmates. The influence of this step had been very good.

Rev. Mr. Crombleholme, of England, thought that the German practice of having the school-master, rather than the magistrate, manage children under twelve, as described by Baron von Holtzendorff, was an excellent one. He also favored the complementary training mentioned, and thought that it was a short-sighted economy to allow considerations of expense to influence public action in this connection.

Mr. Aspinall, of England, while estimating at its full value the good effected through the agency of reformatory, industrial, and public schools, and giving to the system of compulsory education its just due, still thought that all these measures should be supplemented by efforts to improve the homes from which the children came, and to elevate their parents. Here, he considered, was a broad field for Christian philanthropy.

Sir Walter Crofton thought the general feeling of the meeting, as his own conviction certainly, was in favor of the family system.

Dr. Marquardsen, of Bavaria, Dr. Guillaume, of Switzerland, and Rev. Mr. Coit, of Massachusetts, in reply to questions of Mrs. Meredith, stated the practice in their several countries in regard to the illegitimate children of female prisoners. In Bavaria and Massachusetts they become wards of the state, and in Switzerland were taken care of by the local authorities.

Mr. Ford, of England, remarked that it was a singular fact that in

England the more criminal institutions—the reformatories—had remained stationary ten years; and these were now only sixty-four or sixty-five. But the least criminal class of institutions—the industrial schools—had more than doubled in number during the same period. In 1861 there were forty-one, and fifty had been established since. Thus it appeared that the latter were doing away with the necessity for the former.

CHAPTER XXII.

PENITENTIARY SYSTEMS.

§ 1. *The Irish convict system, as explained by Sir Walter Crofton.*—This system first endeavors to make the criminal feel that his punishment is not simply afflictive, but also reformatory. To stimulate him in his reformation the element of hope is combined with the punitive element, and the system of classification shows him that his fate is in his own hands. This classification is the result of a system of marks awarded for intelligence, work, and zeal. They are not given as a reward for mere intelligence, for the most criminal are often intellectually brightest, and would thus be most rewarded. The first thing aimed at is to give the criminal a liking for work, for generally idleness led him to crime. But work will give him no pleasure unless he is remunerated for it. After a certain time passed in a cell, when strengthened and comforted by the visits of the minister, he will live in common with other prisoners. During his treatment on the collective system, the change effected in his character can be appreciated, and he is rewarded by the distribution of marks. He is now arbiter of his own lot, and can only get into a higher class by diligence and zeal. Lastly, when he has given sufficient guarantees of good conduct, he passes into an intermediate prison, which is designed to test the work previously done, as the crucible tests gold. These intermediate prisons, in which the prisoners enjoy a semi-liberty, have produced excellent results. Those living in them conduct themselves as free workmen. Penal labor in all the Irish convict-prisons is prohibited. This system has been proved a triumphant success. Its reformatory results are most encouraging, a consideration more than counter-balancing, even pecuniarily, the slightly increased expense which it may involve. Time, however, is required for its reforming influences to operate; hence the minimum sentence has been fixed at five years. Prisoners who gain a remission of imprisonment receive a “ticket of license,” liberating them conditionally. Escapes among prisoners so liberated are very rare, particularly since the institution of police supervision, under which system each holder of a “ticket of license” is required to report his residence and occupation to the police each month. If such a prisoner is again apprehended before the time for which he was sentenced has expired, he is sent back to the prison from which he was liberated. In reply to a question, Sir Walter stated that prisoners, on arriving at the intermediate prison, were treated with respect and confidence, and that their conduct elsewhere justified this treatment. As an illustration of this proposition, he said that in a certain prison some one of the prisoners was intrusted each week with the execution of errands outside the prison; in seven years only one had returned intoxicated. A prisoner who has relapsed after passing through the intermediate prison is not allowed to return there again. Life-sentenced men, after ten years’ cellular imprisonment with hard labor, are impris-

oned commonly in a special prison, and after twenty years their fate is determined by the government.

§ 2. *The Irish borough and county prisons, as explained by Hon. C. F. Bourke and others.*—The management of these prisons is confined to boards of superintendence, composed each of twelve gentlemen of social position and influence in their respective counties, chosen by the grand juries of the counties. At present there is little uniformity in the discipline of these prisons, but at the last session of Parliament a bill was passed giving to the executive the power to make uniform rules and by-laws for their management. All prisoners, juvenile and adult, male and female, attend the prison schools daily, many of those advanced in life learning both to read and write during their imprisonment. A medical officer is connected with each jail, who is required to visit each prisoner twice a week at least, and oftener if necessary, and who has the right to alter the diet or labor of any prisoner according to his judgment. Each board of superintendence is empowered to appoint, and usually did appoint, three chaplains—one Episcopalian, one Roman Catholic, and one Presbyterian. The great difficulty with which the prison managers have to contend is the number of short sentences, (very many being for only twenty-four hours,) which rather promote crime than check it. A majority of these sentences are inflicted on drunkards, who are wholly undeterred thereby. It amounts practically merely to giving the prisoner a good bed for the night gratuitously, often an unwonted luxury, which is, in many cases, enjoyed by the same prisoner at intervals of a week for more than one hundred times. Mr. Bourke thought that committing magistrates should be empowered to pass cumulative sentences on such prisoners, and that more stringent enactments with reference to the sale of ardent spirits should be incorporated in the law.

§ 3. *The English convict system, as explained by Major C. F. Du Cane.*—[The greater part of Major Du Cane's explanation, having been embodied in his answers to the interrogatories mentioned in Part First of this report, has been epitomized there, and need not be repeated.]

Major Du Cane defended the ticket-of-license system as practised in England. In reply to questions propounded by members of the congress, he stated that life-sentenced prisoners were usually conditionally liberated by the secretary of state after twenty years' cellular imprisonment. He did not consider the number of recidivists any evidence of the value of a prison system. In 1870 more than 25 per cent. of those discharged from the English prisons had relapsed into crime, which was an increase of a little more than 2 per cent. over the preceding year. He said that his ideal would be to see 100 per cent. of recidivists, since this would show that it is always the same men who commit crime, and that the social pest was really limited and localized. Great attention is paid to the industrial training of the convicts in the English prisons, 1,600 out of 2,200 apprenticed to some mechanical trade having learned it completely. A portion of the prisoner's earnings—not exceeding £3—was allowed to him, the sum awarded varying according to his industry. The convict, however, was not allowed to send any portion of this money to his family; but on his discharge it was given to a prisoners' aid society, if he requested their assistance and protection; otherwise, the police were requested to give it to him in small sums. Marks are given the prisoners as a reward for industry, and if the number earned is sufficient, they are promoted from class to class. If any convict feels dissatisfied, he may appeal to the governor, and from him to the director, from whose decision an appeal lies to the secretary of state. Appeals to the director are frequent;

but if the prisoner's statement of facts is false, he is liable to a disciplinary punishment.

§ 4. *The English borough and county prisons, as explained by Captain Armytage, Dr. Mouat, and others.*—Captain Armytage, of England, gave a detailed account of the Wakefield prison, of which he is the governor. The majority of the inmates were sentenced to from three to seven days' imprisonment, many of whom, discharged on Saturday, returned to the prison on the following Monday. The longest term of imprisonment in a county jail is two years for one offense. A majority of the prisoners were misdemeanants who owed their incarceration to intemperance. Penal labor was employed, but seldom except as a punishment for breaches of discipline. Connected with this prison is the industrial home for discharged male prisoners, of which Mr. Browne had made mention. The cost per head in this establishment was 7s. 2d. per week. Some of the inmates' earnings amounted to £1 per week, their employment being mat-making, and light work of that sort. There is also a female home, in which the women are employed principally in washing, and are trained for domestic service, and there is a constant demand for them as servants. A well-assorted library is connected with the prison, to which the inmates have access. Perfect religious equality prevails, both Roman Catholic and Protestant chaplains being employed.

Archbishop Manning addressed the congress at length on the subject of religious freedom in prisons, pleading that the conscience of Roman Catholic prisoners should be protected equally with that of Protestants. He earnestly hoped for the passage by Parliament of an act then before the body making the employment of Roman Catholic chaplains compulsory in every county jail. He stated that no salary would be asked for if objection were made on the ground of expense. The employment of chaplains of his faith was now simply permitted in the county jails, and there were one hundred and nine jails where none were employed. He wished to see it made everywhere obligatory in this class of prisons as it now is in the convict or government prisons.

The remarks of the archbishop elicited general approval from the English members, Dr. Mouat observing that, if there was but one Roman Catholic prisoner in the prison, his receiving religious instruction according to his faith ought to be a matter of right, and not of permission.

§ 5. *The Scotch prison system, as explained by Mr. J. Monclure.*—There is but one general prison in Scotland. No male prisoners are sent here for terms longer than three years, those whose sentence exceeds this being transferred, after a probationary term of nine months, to public-works prisons in England. The system of discipline in the latter prisons is identical with that pursued at Perth. The county jails receive prisoners sentenced for from twenty-four hours to nine months, although, owing to the limited accommodation at Perth, it is sometimes found necessary to retain in the county and borough jails prisoners sentenced for a longer term, in which case their board is paid by the government. Civil and criminal debtors are confined in these jails as well, and are allowed greater privileges. The diet varies according to their sentence, depending upon its duration, and whether with or without hard labor. Corporal punishment is not allowed, except in the case of boys sentenced for petty offenses, and is even then very seldom used. Penal labor is employed, which in most cases is made productive. Nowhere in Scotland do the earnings of prisoners pay for half their maintenance. Gratuities are given to well-conducted and industrious prisoners on their discharge. Convicts discharged from the prison at Perth all receive a

gratuity varying from 5s. to £4, according to their conduct and industry. To receive the latter sum, a prisoner must have had no demerit marks whatever. A portion of the money is given him when he leaves the prison. The remainder is paid in fortnightly installments, on his forwarding a certificate, signed by the police, that he is obtaining an honest livelihood. This police supervision works admirably, protecting those inclined to do well, and acting as a salutary check on those who are disposed to return to vicious courses. The superintendence of all the prisons of Scotland is confined to a central board at Edinburgh, under the direction of the home secretary. They superintend the collection of judicial and penitentiary statistics. One of their number visits the prison at Perth twice a month, sees each prisoner, hears complaints, and inspects the buildings, stores, &c.

§ 6. *The Belgian prison system, as explained by Mr. Stevens.*—The cellular system is strictly enforced in nearly all the Belgian prisons. Mr. Stevens claimed that it possesses two classes of advantages, positive and negative. Among the former he enumerated, with other benefits, the opportunity it affords for the separate study and treatment of each prisoner, and adapting the discipline to the situation and needs of all the prisoners, thus securing the efficacy of the punishment. He considered a variation in the treatment of moral disease as necessary as in that of physical disease. The cellular system also enables the prisoner to preserve the feeling of his dignity as a man and of his personal responsibility. The prevention of moral contagion, the subduing and calming influence of solitude, and the opportunity offered for reflection and repentance were all, in Mr. Stevens's opinion, found in the cellular system. In a word, he considered that no system attained more directly or perfectly the various objects of punishment—repression, expiation, prevention, and reformation. As the prisoner's reform progresses, cellular confinement becomes less and less irksome to him, until at last he would regard removal to a congregate prison as an intolerable punishment. In consequence of its repressive and reformatory efficacy, this system, Mr. Stevens claimed, allowed a diminution of the duration of imprisonment, thus greatly lessening expense. A want of sufficient cellular accommodation alone has prevented the introduction of this system into all the Belgian prisons, and this obstacle is being removed as rapidly as possible. Its results in that country have abundantly justified its adoption. The official returns prove that the average number of recidivists is 4.46 per cent. of those leaving cellular prisons, while it is 68.80 per cent. of those liberated from congregate prisons. Lastly, Mr. Stevens stated the remarkable fact that in Belgium the number of prisoners has decreased during the last six years from 7,000 to 4,000, a result which he attributed in part to the introduction of the cellular system.

§ 7. *The Russian prison system, projected but not yet reduced to practice, as described by Count Sollohub.*—Count Sollohub explained a complete system of penitentiary treatment, full of novel views and original ideas. Want of time prevented him from finishing his explanation, but he submitted a pamphlet on the subject, which was distributed to the members of the congress. This has been translated and printed, as the reader will have observed, in Chapter XIV, Part First, of this report.

§ 8. *The French prison system, as explained by Mr. Béranger.*—Great interest is taken at present in France in the subject of prison reform, and the National Assembly has appointed a commission to inquire into the condition of French prisons and suggest improvements. This commission deputized Mr. Béranger to attend the congress. He said that

the system now followed presented three prominent characteristics: first, young criminals are imprisoned in reformatories; secondly, help is given to the man who commits a first crime; and, thirdly, an attempt is made to get rid of recidivists. It is in effecting the object last named that the greatest difficulty is apprehended.

Being interrogated as to the state of public opinion in France as regards the cellular system, Mr. Béranger said he believed it was not unpopular. He avowed himself an advocate of that system.

§ 9. *The Swiss prison system, as explained by Dr. Guillaume.*—After various experiments, public opinion in Switzerland has become definitively settled in favor of the Crofton system. The details of its application are contained in Part First, and will be further illustrated in Part Fourth.

§ 10. *The Italian prison system, as explained by Count de Foresta.*—There is at present no well-defined and uniform prison system in Italy. A commission, however, has been appointed by the King to prepare a code that shall attain this end. Of this commission both the Count de Foresta and Mr. Beltrani-Scalia were members. The preference of both these gentlemen was for the Crofton, or Irish, system; but this sentiment was not unanimous among the commission, which has not as yet come to any resolution. The count felt quite certain, however, that the cellular system would not be adopted, since it was believed to be ill-adapted to Italian character. At present prisoners were generally imprisoned collectively in galleys, (*bagnes*;) they are chained; but those who distinguish themselves by good conduct are placed in agricultural colonies on the islands.

§ 11. *The German prison system as explained by Herr Ekert and Dr. Varrentrapp.*—Herr Ekert, director of the cellular prison of Bruchsal, in Baden, summarized the provisions of the German penal code. Corporal punishment is abolished, cellular imprisonment and conditional liberation established, and police surveillance humanely conducted but firmly maintained. Separate imprisonment in Germany, when applied to women as well as to men, produced excellent results. Formerly in Baden the maximum duration of cellular imprisonment was ten years; the new German penal code has fixed it at only three years. Herr Ekert avowed himself an earnest supporter of the cellular system and concurred in all the conclusions of Mr. Stevens. In his own prison he has seen convicts live thirteen years in separate confinement without any inconvenience. He alleged that recidivists were very rare among those who had undergone this punishment for many years, and furnished results tending to show that its influence on the moral and physical health of the prisoners was very beneficial. In reply to interrogatories Mr. Ekert said that there were no criminal statistics in Germany. He added that all prisoners except 1 per cent. could endure cellular confinement for life without inconvenience.

Baron von Holtzendorff congratulated Herr Ekert on the results obtained at Bruchsal, but added immediately that, notwithstanding these results, he himself did not approve of that system; that the public opinion of Germany was opposed to it, and that an executive committee sitting at Berlin, under one of the city magistrates as president, had unanimously decided to apply the cellular treatment in cases of short imprisonment, and the progressive system of Sir Walter Crofton when longer sentences had to be undergone.

Dr. Varrentrapp, of Frankfort, vigorously contested the statement that public opinion in Germany had pronounced against the cellular system. In the Grand Duchy of Baden, at Frankfort, in Würtemberg, Hanover, the Grand Duchy of Hesse, and Bavaria, it had been adopted,

and it was only on financial grounds that it was not more completely applied. Bavaria had, however, already built a magnificent cellular prison, which had produced excellent results. Dr. Varrentrapp considered that the new German penal code prefers and adopts the cellular system. His own preference therefor was, he said, supported by the experience and study of forty years; and he combated the attacks made against this system, which appeared to him to have a most rational basis.

§ 12. *The Netherland's prison system, as explained by Mr. Ploos van Amstel.*—In Holland the Belgian, or cellular, system is to a very considerable extent in operation, the maximum of separate confinement being two years. The prisoners are employed in a variety of industries, and gratuities are allowed for diligence. As a magistrate and inspector, he had, for many years, visited the prisoners in the cellular prison of Amsterdam, and always found their health excellent, better even than he found it in collective prisons. He never observed bad results, either as respects their moral or physical condition. For this reason he supported the opinions of M. Stevens.

§ 13. *The Swedish prison system, as explained by M. Almquist.*—M. Almquist said that in Sweden serious attention was given to penitentiary reform. Sweden in this respect had still much to accomplish and much to learn from other countries. The cellular system is there in operation, and has not been followed by the evil results attributed to it by its adversaries. The prisoners enjoy better health in the cellular than in the collective prisons, while the cases of insanity are also fewer in the former prisons.

§ 14. *The Austrian prison system, as explained by Dr. Frey.*—Dr. Frey stated that up to the present time in Austria the collective system, pure and simple, had been practised, without classification or separation of any kind. At first they had thought of introducing the cellular system as practised in Belgium, but, fearing it would interfere with the health of the prisoners, preference had been given to the progressive system. A maximum duration of three years' cellular imprisonment is followed by life in common and by classes more or less privileged. Conditional liberation has not yet been introduced.

§ 15. *Prison system of India, as explained by Dr. Mouat and others.*—A synopsis of the paper read by Dr. Mouat on the Indian prison system has been already given in Part First, Chapter XVI. Mr. Thornton and Dr. Grey, of India, supplemented the account furnished by Dr. Mouat by giving some interesting statistical details relative to the prisons of the Punjaub. In other respects, however, their statements shed no new light upon the internal operation of the system, beyond the lucid description of Dr. Mouat.

§ 16. *The prison system of the United States, as explained by Hon. Joseph R. Chandler, General Pilsbury, and others.*—The representatives from New York, Pennsylvania, Indiana, and Maine present in the congress described each the prisons of his own State. It was remarked that, owing to the independence of the several States of the Union of each other, a uniform system throughout the country was impossible. The eastern penitentiary of Pennsylvania is the only prison in the United States conducted on the cellular plan. Its managers are abundantly satisfied of the superiority of this system over that of congregate labor. General Pilsbury and Dr. Wines deplored the influence of party politics upon the state-prisons of New York, and expressed a belief that a radical change in the fundamental law of the State would soon render a recurrence of the present evils impossible. A brief outline was also given of the plan upon which it is proposed to construct and manage a new State adult

reformatory at Elmira. To this prison are to be sent young men between the ages of sixteen and twenty-five. There would be, so to speak, three prisons under one roof, and the prisoners would have to begin at one and would be advanced to the others, as they earned such promotion by good conduct. The system would be that of Sir Walter Crofton, slightly modified.

The county jails throughout the country were represented, with few exceptions, as inadequate, in every way, for the work required of them. This fact was freely admitted by a majority of the American delegates, many of whom, however, expressed a hope soon to see radical reforms instituted in their own States.

CHAPTER XXIII.

CONCLUDING SESSION OF THE CONGRESS.

§ 1. *Presentation of the works of Edward Livingston on criminal jurisprudence.*—Dr. Wines offered to the acceptance of the congress a set of the complete works of Edward Livingston, in two volumes, published in America fifty years ago. He also presented, at the same time, for M. Vergé, a member of the Institute of France, an edition of the same work in French, recently published under the auspices of the Institute. He stated that, through funds generously proffered for the purpose, the National Prison Association of the United States had then in press, and would shortly issue, a new American edition of Livingston. It was, he said, a remarkable as well as pleasing circumstance that there should meet on that floor, and be presented to the congress, French and American editions of a work which, though written and published a full half century ago, had anticipated most of the great reforms in prison discipline which the world is now slowly and laboriously engaged in working out. M. Vergé had been called to Paris that morning by duties which could not be postponed, but had handed to him, together with the book, a letter addressed to the president of the congress, which would be read in French, and afterward translated into English by Musurus Bey, a delegate to the congress commissioned by the Sublime Porte. The letter was then read as follows:

LONDON, July 12, 1872.

MR. PRESIDENT: I have the honor to ask you to offer to the International Congress on Prison Reform a copy of the French edition of the great work of Livingston, one of the most eminent men of the United States of America, and among the most zealous pioneers in the reform of the penal and penitentiary system. This edition is preceded by a biographical sketch of Mr. Livingston by M. Mignet, and a critical essay by M. Charles Lucas, a member of the Institute of France, the friend and successor of Livingston in his labors in behalf of penitentiary reform, undertaken half a century ago. Livingston was a member of the Institute of France, (Academy of Moral and Political Sciences.) He has found in the Old World as well as the New admirers and followers. Receive, Mr. President, the assurance of my most distinguished sentiments.

CHARLES VERGÉ.

Member of the Institute.

Archbishop Manning, who had intended to offer some remarks on the work thus presented to the congress, but forbore to do so lest he should occupy time that might be needed for other purposes, subsequently addressed the following letter to Dr. Wines:

8 YORK PLACE, July 21, 1872.

MY DEAR SIR: Our thanks are due to you in chief for the International Prison Congress, which has resulted not only in much valuable information, but in the estab-

lishment of a permanent union of correspondence in respect to the statistics and discipline of prisons. But for the initiative taken by you and by the Government of the United States, I do not think this would have been attained. We have also to thank you for Mr. Livingston's valuable work on reform and prison discipline. I am sorry that it did not arrive earlier in our proceedings. Mr. Livingston was before his time. He has anticipated the substance of our late discussions on the separate system in his words, "Imprisonment with seclusion and labor will diminish offenses; imprisonment without seclusion will increase them." I was not aware that this had been tried and proved so long ago as 1791 in the United States. His book is worthy of his high name as a just and good man. I am sorry that I had not the opportunity of expressing what I think is due to Mr. Livingston as a forerunner in the recent amelioration of our prison-discipline, which is, day by day, becoming vital to the welfare and even to the safety of the civil society of the world.

Believe me, my dear sir, yours, very faithfully,

† HENRY E.,
Archbishop of Westminster.

The Rev. Dr. WINES.

§ 2. *Presentation to the congress of M. Charles Lucas's observations on the Penitentiary Congress of London.*—In making this presentation to the congress, Dr. Wines said that, as the observations of M. Lucas were addressed to the French Academy of Moral and Political Sciences, and would not therefore be embodied in the proceedings of the congress, and as they lacked nothing of the value that would naturally attach to them from the long study, large experience, and eminent ability of the writer, he would ask the indulgence of that body in offering a brief *résumé* of the important paper submitted by him. He said:

M. Lucas remarks that such reunions as the congress of London are a necessary consequence of the two laws of the sociability and perfectibility of man, which, in an advanced civilization, require the international exchange of ideas for the moral progress of humanity just as they do that of material commodities for the increase of national wealth. International congresses show the respective conditions of nations as regards their intellectual and moral development in the same manner as international industrial exhibitions do the comparative results of their economic development. Heretofore there have been congresses of governments and congresses of peoples, but the Congress of London is original and unique in that it combines both these elements. After a rapid glance at the work of organizing the congress, M. Lucas proceeds to offer some general considerations in relation to the subject. He says that Beccaria and Howard were, and ought to have been, philanthropists, for that character was demanded of them by the cruelties of both the criminal law and the criminal administration of their age. But the times have happily changed since then, and with them ideas and usages as well. Man, in the state of penal servitude, is no longer a thing, but a moral being, whose liberty human justice has not the right to confiscate absolutely and irrevocably, but only within the limits required by the protection and security of social order. The logical sequence of this view is that it is the duty of society to reform the criminal during his temporary privation of liberty, since in this way only can the peril of his relapse be successfully combated, and the public safety effectually maintained. The reformation of imprisoned criminals is not, therefore, in our day, a work of philanthropy, but an obligation of the state.

M. Lucas claims that the discipline of the Catholic Church furnished the model for both the cellular and associated systems of imprisonment, since known as those of Pennsylvania and Auburn, save that the Auburn system added corporal chastisements to the discipline of silence, and the Pennsylvania system subtracted worship in common, to the detriment of religion, and associated exercise at the expense of humanity. M. Lucas recalls to the memory of the academy the discussion of the 10th, 17th, and 24th of February, 1844, in which, single-handed, he contended against the three ablest supporters of the Pennsylvania system in France—Messrs. Béranger, de Tocqueville, and de Beaumont. It was not that he was absolutely opposed to isolation by day and night, since in his "Theory of Imprisonment," published in 1836, he was the first to propose the application of the cellular system to prisoners awaiting trial; and, in the sphere of imprisonment after sentence, he would not wholly exclude the use of the system, but would restrict its duration to one year. It was at the point of departure from this limit that the controversy began between M. Lucas and his distinguished associates, they contending for an unlimited and he for a restricted application of the cellular system. The inadmissibility of isolation in long imprisonments he grounds on the following considerations: Man is born sociable and perfectible, and it is by the action of his sociability that his perfection is secured. Isolation is, therefore, a de-

nial of the necessary process for his perfection; it is a violence done to his nature which cannot be safely prolonged for any great length of time. Experience must infallibly confirm this philosophical demonstration, since the education of any being whatsoever is but the development of his nature. Penitentiary education must act with the certainty of enlightening and invigorating the intelligence of the convict, and not by exposing him to the peril of weakening and even of destroying that essential instrument of his regeneration. Cellular isolation, in effect, does not permit either the initiative, the effort, or the probation, without which there can be neither morality nor moral reformation, (*ni moralité ni moralisation.*)

M. Lucas discusses in his pamphlet the proper number of prisoners to be admitted into any one penitentiary establishment, and arrives at the conclusion that four hundred is the maximum that can be treated effectively for their reformation. He grounds this belief on the consideration that only a moderate number of prisoners will permit that serious personal influence which, in order to their reformation, must be exercised upon them by the director and his co-laborers. He adds that, during his long administrative career as inspector of French prisons, he never ceased, but always in vain, to cry out against the agglomeration in the central prisons as creating an impossibility of penitentiary reform, and asks whether any one can suppose that, in those immense barracks of ten, twelve, fifteen hundred prisoners, the director can know them otherwise than by their numbers? Where is the use, he says, of talking of penitentiary reform when it is rendered impossible by such numbers of prisoners congregated in the same prison? In short, M. Lucas finds the following to be the essential conditions of a reformatory prison discipline, namely: isolation at night, the rule of silence during the day, a maximum of four hundred prisoners in any one establishment, and progressive classification.

§ 3. *Propositions submitted to the congress by the American delegation.*—This series of propositions was offered some days previous to the final session, but is introduced at this point because it formed the basis, as will be seen under the next section, of the declaration of principles embodied in the final report of the executive committee and approved by unanimous vote of the congress. The propositions are as follows:

1. The treatment of criminals by society is for the protection of society. But, since such treatment is directed rather to the criminal than to the crime, its great object should be his moral regeneration. Hence it should be made a primary aim of prison discipline to reform the criminal, and not simply to inflict upon him a certain amount of vindictive suffering. The best guarantee of the public security against a repetition of his crime is the re-establishment of moral harmony in the soul of the criminal himself—his new birth to a respect for the laws.

2. In the moral regeneration of the criminal, hope is a more powerful agent than fear; it should therefore be made an ever-present force in the minds of prisoners by a well-devised and skillfully-applied system of rewards for good conduct, industry, and attention to learning. Such rewards may be a diminution of sentence, a participation in earnings, a gradual withdrawal of restraint, and a constant enlargement of privilege, as these shall be severally earned by meritorious conduct. Rewards more than punishments are essential to every good penitentiary system.

3. The progressive classification of prisoners based on merit, and not on any mere arbitrary principle—as crime, age, &c.—should be established in all prisons designed for the treatment of convicted criminals. In this way the prisoner's destiny during his incarceration should be placed, measurably, in his own hands; he must be put into circumstances where he will be able, through his own exertions, to continually better his condition. A regulated self-interest must be brought into play. In the prison, as in free society, there must be the stimulus of some personal advantage accruing from the prisoner's efforts. Giving prisoners an interest in their industry and good conduct tends to give them beneficial thoughts and habits, and what no severity of punishment will enforce a moderate personal interest will readily obtain.

4. In criminal treatment moral forces should be relied on with as little admixture of physical force as may be; organized persuasion, to the utmost extent possible, should be made to take the place of coercive restraint, the object being to make upright and industrious *freemen*, rather than orderly and obedient *prisoners*. Brute force may make good prisoners; moral training alone will make good citizens. To the latter of these ends the living soul must be won; to the former only the inert and obedient body. To compass the reformation of criminals, the military type in prison management must be abandoned, and a discipline by moral forces substituted in its place. The objects of military discipline and prison discipline, being directly opposed to each other, cannot be pursued by the same road. The one is meant to train men to act together, the other to prepare them to act separately. The one relies upon force, which never yet created virtue; the other on motives, which are the sole agency for attaining moral ends. The special object of the one is to suppress individual charac-

ter and reduce all to component parts of a compact machine; that of the other is to develop and strengthen individual character, and by instilling right principles to encourage and enable it to act on these independently.

5. Nevertheless, unsuitable indulgence is as pernicious as unsuitable severity, the true principle being to place the prisoner in a position of stern adversity, from which he must work his way out by his own exertions—that is, by diligent labor and a constant course of voluntary self-command and self-denial. As a rule, reformation can be attained only through a stern and severe training. It is in a benevolent adversity, whether in the freedom of ordinary life or the servitude of the prison, that all the manly virtues are born and nurtured. It is easy enough for a bad man to put up with a little more degradation, a little more contumely, a few more blows or harsh restrictions; but to set his shoulder to the wheel, to command his temper, his appetites, his self-indulgent propensities, to struggle steadily out of his position—and all voluntarily, all from an inward impulse, stimulated by a moral necessity—this is a harder task, a far heavier imposition. Yet it is just this training that a right prison discipline must exact, and only through such training that it can succeed.

6. It is essential to a reformatory prison treatment that the self-respect of the prisoner should be cultivated to the utmost, and that every effort be made to give back to him his manhood. Hence, all disciplinary punishments that inflict unnecessary pain or humiliation should be abolished as of evil influence; and, instead, the penalty of prison offenses should be the forfeiture of some privilege, or of a part of the progress already made toward liberation, with or without diminished food, or a period of stricter confinement. There is no greater mistake in the whole compass of penal discipline than its studied imposition of degradation as a part of punishment. Such imposition destroys every better impulse and aspiration. It crushes the weak, irritates the strong, and indisposes all to submission and reform. It is trampling where we ought to raise, and is, therefore, as unchristian in principle as it is unwise in policy. On the other hand, no imposition would be so improving, none so favorable to the cultivation of the prisoner's self-respect, self-command, and recovery of manhood, as the making of every deviation from the line of right bear on present privilege or ultimate release. Such punishments would be as the drop of water, that wears away the granite rock, and would, without needless pain or wanton cruelty, and especially without further injury to their manhood, subdue at length even the most refractory.

7. A system of prison discipline, to be truly reformatory, must gain the will of the convict. He is to be amended, but this is impossible with his mind in a state of hostility. No system can hope to succeed which does not secure this harmony of wills, so that the prisoner shall choose for himself what his officer chooses for him. But to this end the officer must really choose the good of the prisoner, and the prisoner must remain in his choice long enough for virtue to become a habit. This consent of wills is an essential condition of reformation, for a bad man can never be made good against his consent. Nowhere can reformation become the rule instead of the exception, where this choice of the same things by prison keepers and prison inmates has not been attained.

8. No prison can become a school of reform till there is, on the part of the officers, a hearty desire and intention to accomplish this object. Where there is no prevalent aim to this effect, there can be no general results in this direction. Such a purpose, however, universally entertained by prison officers, would revolutionize prison discipline by changing its whole spirit; and fit reformatory processes would follow such change as naturally as the harvest follows the sowing. It is not so much any specific apparatus that is needed, as it is the introduction of a really benevolent spirit into our prison management. Once let it become the heartfelt desire and purpose of prison-officers to reform the criminals under their care, and they will speedily become inventive of the methods adapted to the work.

9. In order to the reformation of imprisoned criminals, there must also be in the minds of prison officers a serious conviction that they are capable of being reformed, since no man can heartily pursue an object at war with his inward beliefs; no man can earnestly strive to accomplish what in his heart he despairs of accomplishing. Doubt is the prelude of failure; confidence a guarantee of success. Nothing so weakens moral forces as unbelief; nothing imparts to them such vigor as faith. "Be it unto thee according to thy faith," is the statement of a fundamental principle of success in all human enterprises, especially when our work lies within the realm of mind and morals.

10. The task of changing bad men into good ones is not one to be confided to the first-comers. It is a serious charge, demanding thorough preparation, entire self-devotion, a calm and cautious judgment, great firmness of purpose and steadiness of action, a keen insight into the springs of human conduct, large experience, a true sympathy, and morality above suspicion. Prison officers, therefore, need a special education for their work, as men do for the other great callings of society. Prison administration should be raised to the dignity of a profession. Prison officers should be organized in a gradation of rank, responsibility, and emolument; so that persons entering the

prison service in early life, and forming a class or profession by themselves, may be thoroughly trained in all their duties, serving in successive positions till, according to their merits, tested chiefly by the small proportion of re-convictions, they reach the position of governors of the largest prisons. Thus alone can the multiplied details of prison discipline be perfected, and uniformity in its application be attained. For only when the administration of public punishment is made a profession will it become scientific, uniform, and successful in the highest degree.

11. Work, education, and religion (including in this latter moral instruction) are the three great forces to be employed in the reformation of criminals. (a) Industrial training should have a broader and higher development in prisons than is now commonly the case. Work is no less an auxiliary to virtue than it is a means of support. Steady, active, useful labor is the basis of all reformatory discipline. (b) Education is a vital force in the reformation of the fallen. Its tendency is to quicken thought, inspire self-respect, incite to higher aims, open new fields of exertion, and supply a healthful substitute for low and vicious amusements. (c) Of all reformatory agencies, religion is first in importance, because most powerful in its action upon the human heart and life. In vain are all devices of coercion and repression, if the heart and conscience, which are beyond all power of external control, are left untouched.

12. Individualization is an essential principle of a reformatory prison discipline. To insure their highest improvement prisoners must, to a certain extent, be treated personally. While they are all placed under a general law, the conduct of each should be specially noted. The improving effect of such a verification, to each, of his progress in virtue would be great. It would be a first step toward restoring to him that feeling of self-respect, without which no recovery will ever be found permanent. Each should be enabled to know the light in which his conduct is viewed by those placed over him; for thus alone, as his good resolutions strengthen, will he be enabled to correct that wherein he may be found deficient. The statement of this principle affords an indication as to the maximum number of prisoners proper to be detained in a penitentiary establishment; but it by no means settles that question; nor indeed can such definite and positive settlement ever be arrived at, since the question is one which must necessarily be left to the judgment and convenience of each individual state or community.

13. Repeated short sentences are believed to be worse than useless, their tendency being rather to stimulate than to repress transgression in petty offenders. The object here is less to punish than to save. But reformation is a work of time; and a benevolent regard to the criminal himself, as well as the protection of society, requires that his sentence be long enough for reformatory processes to take effect. It is the judgment of this congress that every penal detention should have in view, above all, the time of the prisoner's liberation, and that the entire discipline of a prison should be organized mainly with a view to prevent relapses. If by a short and sharp first imprisonment it is important to give an energetic notice so as to prevent the propagation of evil, it is no less important afterward, by means of sentences of a longer duration, to prepare, in a manner more sustained and efficacious, the habitual petty transgressor for his re-entrance into society as a reformed, industrious, and useful citizen.

14. Preventive agencies, such as general education, truant-homes, industrial schools, children's aid societies, orphan-asylums, and the like, designed for children not yet criminal, but in danger of becoming so, constitute the true field of promise, in which to labor for the prevention and diminution of crime. Here the brood may be killed in the egg, the stream cut off in the fountain; and whatever the cost of such agencies may be, it will be less than the spoliations resulting from neglect, and the expense involved in arrests, trials, and imprisonments.

15. The successful prosecution of crime requires the combined action of capital and labor, just as other crafts do. There are two well-defined classes engaged in criminal operations, who may be called the capitalists of crime and its operatives. It is worthy of inquiry whether society has not made a mistake in its warfare upon crime, and whether it would not be better and more effective to strike at the few capitalists as a class than at the many operative plunderers one by one. Let it direct its blows against the connection between criminal capital and criminal labor, nor forbear its assaults till it has wholly broken and dissolved that union. We may rest assured that when this baleful combination shall be pierced in its vital part, it will perish; that when the corner-stone of the leprous fabric shall be removed, the building itself will tumble into ruins.

16. More systematic and comprehensive methods should be adopted to save discharged prisoners by providing them with work and encouraging them to redeem their character and regain their lost position in society. The state has not discharged its whole duty to the criminal when it has punished him, nor even when it has reformed him. Having lifted him up, it has the further duty to aid in holding him up. In vain shall we have given the convict an improved mind and heart, in vain shall we have imparted to him the capacity for industrial labor and the will to advance himself by worthy means, if, on his discharge, he finds the world in arms against him, with none to trust him, none to meet him kindly, none to give him the opportunity of earning honest bread.

17. Since personal liberty is a right as respectable as the right of property, it is the duty of society to indemnify the citizen who has been unjustly imprisoned, on proof of his innocence, whether at the time of his trial or after his sentence, as it indemnifies the citizen from whom it has taken his field or his house for some public use.

18. It is the conviction of this congress that one of the most effective agencies in the repression of crime would be the enactment of laws for the education of all the children of the state. Better to force education upon the people than to force them into prison to expiate crimes of which the neglect of education and consequent ignorance have been the occasion, if not the cause.

19. This congress defends as just and reasonable the principle of the responsibility of parents for the full or partial support of their children in reformatory institutions. The expense of such maintenance must fall on somebody, and on whom can it fall more fitly than on the child's parent, whose neglect or vices have probably been the occasion of its lapse into crime?

20. This congress arraigns society itself as in no slight degree accountable for the invasion of its rights and the warfare upon its interests practised by the criminal classes. Does society take all the steps which it easily might to change the circumstances in our social state that lead to crime, or, when crime has been committed, to cure the proclivity to it generated by these circumstances? It cannot be pretended. Let society, then, lay the case earnestly to its conscience, and strive to amend in both directions. Offenses, we are told by a high authority, must come, but a special woe is denounced against those through whom they come. Let states and communities take heed that that woe fall not upon their head.

21. The systems of criminal statistics stand in urgent need of revision and amendment. The congress judges it expedient and desirable that greater uniformity should be secured in making up the statistics in this department of the public service in different countries, to the end that comparisons may be the more readily made, that conclusions may be the more accurately drawn, and that criminal legislation may with greater safety be based upon the conclusions so reached.

22. Prison architecture is a matter of grave importance. Prisons of every class should be substantial structures, affording gratification by their design and material to a pure taste, but not costly or highly ornate. The chief points to be aimed at in prison construction are security, perfect ventilation, an unfailing supply of pure water, the best facilities for industrial labor, convenience of markets, ease of supervision, adaptation to reformatory aims, and a rigid, though not parsimonious, economy.

23. A right application of the principles of sanitary science in the construction and arrangement of prisons is a point of vital moment. The apparatus for heating and ventilation should be the best that is known; sunlight, air, and water should be afforded according to the abundance with which nature has provided them; the dietary and clothing should be plain but wholesome, comfortable, and in sufficient, but not extravagant, quantity; the bedsteads, beds, and beddings not costly, but decent, well-aired, and free from vermin; the hospital accommodations, medical stores, and surgical instruments should be all that humanity requires or science can supply; and all needed means for personal cleanliness should be without stint.

24. As a principle that crowns all and is essential to all, it is our conviction that no prison system can be perfect, or successful to the most desirable extent, without some central and supreme authority to sit at the helm, guiding, controlling, unifying, and vitalizing the whole. All the departments of the preventive, reformatory, and penal institutions of a state should be molded into one homogeneous and effective system, its parts mutually answering to and supporting one another, and the whole animated by the same spirit, aiming at the same objects, and subject to the same control, yet without loss of the advantages of concurring local organizations and of voluntary aid, wherever such aid is attainable and may be judiciously and wisely admitted.

25. This congress is of the opinion that, both in the official administration of such a system and in the voluntary co-operation of citizens therein, the agency of women may be employed with good effect.

§ 4. *Propositions embodied in the final report of the executive committee, and adopted by the congress as expressing its conception of the fundamental principles of prison discipline.*—The committee, after briefly reciting the history of the congress and setting forth the work done by it during its ten days' sessions, thus epitomizes the longer paper of the American delegation, and submits to the congress what in our country would be called the draught of its platform:

Recognizing as a fundamental fact that the protection of society is the object for which penal codes exist and the treatment of criminals is devised, the committee believes that this protection is not only consistent with, but absolutely demands, the enunciation of the principle that the moral regeneration of the prisoner should be a

primary aim of prison discipline. To attain this aim, hope must always be a more powerful agent than fear; and hope should therefore be constantly sustained in the minds of prisoners by a system of rewards for good conduct and industry, whether in the shape of a diminution of sentence, a participation in earnings, a gradual withdrawal of restraint, or an enlargement of privilege. A progressive classification of prisoners should, in the opinion of the committee, be adopted in all prisons.

In the treatment of criminals, all disciplinary punishments that inflict unnecessary pain or humiliation should be abolished, and the penalties for prison offenses should, so far as possible, be the diminution of ordinary comforts, the forfeiture of some privilege, or of a part of the progress made toward liberation. Moral forces and motives should, in fact, be relied on, so far as is consistent with the due maintenance of discipline; and physical force should be employed only in the last extremity. But in saying this, the committee is not advocating unsuitable indulgence, which it believes to be as pernicious as undue severity. The true principle is to place the prisoner—who must be taught that he has sinned against society and owes reparation—in a position of stern adversity, from which he must work his way out by his own exertions. To impel a prisoner to this self-exertion should be the aim of a system of prison discipline, which can never be truly reformatory unless it succeeds in gaining the will of the convict. Prisoners do not cease to be men when they enter the prison-walls, and they are still swayed by human motives and interests. They must, therefore, be dealt with as men—that is, as beings who possess moral and spiritual impulses as well as bodily wants.

Of all reformatory agencies religion is first in importance, because it is the most powerful in its action upon the human heart and life. Education has also a vital effect on moral improvement, and should constitute an integral part of any prison system. Steady, active, and useful labor is the basis of a sound discipline, and at once the means and test of reformation. Work, education, and religion are consequently the three great forces on which prison administrators should rely. But to carry out these principles individualization becomes essential; prisoners, like other men, must be treated personally, and with a view to the peculiar circumstances and mental organization of each. The committee need not say that to carry out such views prison officers are required who believe in the capacity of prisoners for reformation and enter heartily into that work. They should, as far as possible, receive a special training for their duties, and should be organized in such a gradation of rank, responsibility, and emolument as may retain experience and efficiency in the service, and lead to the promotion of the most deserving.

But if a sound system of prison discipline be desirable, it is no less expedient that the prisoner on his discharge should be systematically aided to obtain employment, and to return permanently to the ranks of honest and productive industry. For this purpose a more comprehensive system than has yet been brought to bear seems to be desirable.

Nor can the committee omit to say that it is in the field of preventive agencies, such as general education, the establishment of industrial and ragged schools, and of other institutions designed to save children not yet criminal, but in danger of becoming so, that the battle against crime is in a great degree to be won. In this, as in the general question of the reclamation of the guilty and erring, the influence of women devoted to such work is of the highest importance; and the committee rejoices that this congress has had the advantage of the presence and counsel of many ladies, whose practical acquaintance with prisons and reformatories has given weight to their words, and whose example furnishes hope for the future.

Lastly, the committee is convinced that the systems of criminal statistics now in force stand in urgent need of revision. Greater uniformity should be secured, and means taken to insure a higher standard of accuracy and trustworthiness in this branch of the statistics of different countries.

Mr. Hastings, of England, moved the adoption of the report, and in doing so expressed the hope that in any international scheme of prison statistics which might be devised, special care would be taken to insure the trustworthiness of the facts reported. At present, he said, such statistics are, in a great measure, delusive, because no guide is afforded by them as to the circumstances under which they were taken. Major Du Cane has pointed out that the number of reconvictions was but an imperfect test of any system. The question was, not what was the number of reconvictions, but under what circumstances did they take place? If we had to deal with a set of habitual offenders, we should most probably have a high rate of reconviction, whatever the system might be; whereas, if we have a large number of average criminals, the percentage of reconvictions would naturally be less.

Governor Haines, of the United States, said that he felt honored by being asked to second the motion to adopt the report. He did so with great pleasure. The propositions presented were comprehensive, yet specific; broad in their generalizations, yet sufficiently minute for all practical purposes. They constituted an organic rule of action, which, while applicable to all countries, was susceptible of adjustment to the special ideas and circumstances of each. They might be termed a constitutional law, to be applied and enforced by particular enactments. He hoped that the motion to adopt the report would receive the unanimous vote of the congress.

Miss Carpenter said it was impossible to exaggerate the importance of this congress and its work. It inaugurated absolutely a new era in the history of civilization. The chairman would recollect that, when many years ago he presided over a committee on juvenile delinquency, it was most difficult to persuade the members of the committee and the public that even children ought not to be severely punished for crimes, and their reformation was deemed quite a secondary consideration. As a witness she was asked, "Do you not consider that children who have broken the law owe retribution to society?" and her answer was, "Society owes retribution to them." She was proud of that answer. Its truth and justness have been substantially recognized by this congress.

The president, Sir John Packington, before putting the question, begged to remind the congress that the report before them was the unanimous report of an essentially representative committee, which consisted of one delegate from each of the many nations represented; the fact that, after many days' discussion by the congress of subjects of the deepest interest, as well as most complicated and difficult, such a committee had agreed unanimously upon a report of great breadth and comprehensiveness, claiming to represent the general sentiment of the congress on all the great questions considered and debated by it. This fact he considered one on which the body might well be congratulated as a satisfactory termination of its proceedings. Such unanimous agreement fairly justified the conclusion that the discussions had not been in vain. A body of men, occupying the best possible position for knowing the sentiments of the congress, and perfectly competent to understand them, had unanimously reported, as embodying those sentiments, a series of propositions, enumerating great principles, which covered almost the whole field of penitentiary science and prison discipline. It was, therefore, a matter of satisfaction and thankfulness that the interesting debates had not been unproductive of good result.

The motion on the adoption of the report was then put, and was agreed to without dissent.

§ 5. *Creation of a permanent international penitentiary commission.*—On the recommendation of the executive committee a permanent organization, under the above designation, was created, charged with the duty of watching over the general interests of international prison reform, but more especially with that of preparing formulas for the collection of penitentiary statistics, and seeking to secure their adoption and use in all countries. This commission is composed of the following gentlemen: Dr. Wines, of the United States, president; Mr. Beltrani-Scalia, of Italy, secretary; Mr. Loyson, of France; Baron von Holtzendorff, of Germany; Count Sollohub, of Russia; Mr. Hastings, of England; Dr. Frey, of Austria; Mr. Stevens, of Belgium; Mr. Pols, of Netherlands; Dr. Guillaume, of Switzerland.

It is understood that the first meeting of the commission will be held in Brussels, Belgium, during the month of September, 1873.

§ 6. Dr. Wines reported from the international executive committee a resolution of thanks to its chairman, Mr. Hastings, and moved its adoption by the congress. He said that the resolution had received the unanimous and cordial approval of the committee, whose members all recognized their obligations to their chairman for the dignity, courtesy, fairness, and ability with which he had presided over their deliberations. Although the congress could not know, as his colleagues knew, the value of his services in the committee-room, yet he felt sure that the whole house would concur with the members of the committee in the vote of thanks now proposed.

Archbishop Manning, in seconding the resolution, said that their thanks were due, not only to those who had come from all countries to the congress, but also to those who, being on the spot, had labored incessantly, not simply during the last three weeks, but for a long time past, in preparing for the congress. To them thanks were greatly due for their unwearied industry and close application, and, he must say, for the happy termination of the congress.

A member proposed to include a vote of thanks to Mr. Pears, secretary of the congress.

The chairman said he could not put these resolutions to the meeting without adding an expression of his own deep sense of the valuable and important assistance which the congress had received from Mr. Hastings and Mr. Pears, and his belief that, had it not been for the happy combination of zeal and ability which had distinguished their exertions, the proceedings of the congress would not have been so satisfactory as they had been.

The resolution was carried unanimously.

§ 7. Mr. Aspinall, of England, proposed a vote of thanks to Dr. Mouat, for the invaluable services he had rendered the congress in translating the many-tongued speeches which had been addressed to it. He had never met with a man who could translate every language into every other with such promptness, elegance, and force as Dr. Mouat, superadded to which the doctor had the great advantage of being thoroughly acquainted with all the questions which came before the congress for discussion. He felt sure that he need only name these things to call forth a cordial response from the meeting.

Baron Mackay, of Holland, in seconding the proposition of Mr. Aspinall, took occasion also to make recognition of the valuable assistance of Sir Walter Crofton and Major Du Cane. He represented a foreign legislature which had not yet adopted a system of prison discipline; therefore, he had listened with great attention to all proposals, and the arguments by which they had been supported, and he was sure that in his country the volume of transactions, which they would owe to the editorial care of Mr. Pears, would be carefully read and digested. England and Ireland were in possession of a system, but on the continent that compliment could be paid only to Belgium. This fact showed that the people of other countries had not yet made up their minds, and was in itself a justification of this congress. Differences of nationality could not account for the wide discrepancies of opinion and experience as to separate and associated confinement.

The motion was carried without dissent.

§ 8. Dr. Guillaume, of Switzerland, moved a resolution of thanks to Dr. Wines. His name was the first word spoken in the congress, and it should be the last. The conference had begun with him; and it should end with an acknowledgment of his efforts. He represented the Anglo-Saxon race, the champion of humanity and of all that concerned the

well-being of the human family. That race stood foremost in the new order of civilization which was dawning on the world, and by the arbitration at Geneva it had set an example to all countries of a pacific settlement of differences and the abolition of that greatest of crimes, war. Switzerland was grateful to England and the United States for having chosen it as the seat of that tribunal, and it was a good omen that Geneva, the cradle of the organization for the succor of the wounded on the battle-field, should be the scene of a great international arbitration. The abolition of slavery in America, the Geneva arbitration, and this great congress for the reformation of prisoners, were gratifying tokens of the new order of things.

Dr. Marquardsen, on behalf of the German delegates, seconded the motion. Before the congress met they all felt that Dr. Wines was the heart and soul of the undertaking; and, now that it had closed, they were sensible that to him they had been deeply indebted for its satisfactory progress and conduct. The German Parliament, of which he was a member, would shortly be engaged in framing a general law of prison discipline, and he doubted not that the law would show many traces of the beneficial results of this congress.

Sir John Packington, in putting the resolution, testified to the important part Dr. Wines had taken in convening and carrying on the congress. The motion was carried unanimously.

Dr. Wines said the remarks which had been made and the vote which had been passed were more than a reward for all the toil and anxiety which he had undergone during the three years he had devoted to preparing and organizing the congress. It had in all respects surpassed his expectations, and he assured them of his best wishes for the successful prosecution of the great work of penitentiary reform in the various countries whence they came, and which they so ably represented.

§ 9. Mr. Hastings, of England, proposed a vote of thanks to Sir John Packington, the president for the day. No English statesman could more fitly have occupied that position. Prior to being called on by his sovereign to those high offices which he had filled with so much honor to himself and advantage to the country, he was for twenty-five years at the head of the Worcestershire quarter-sessions, and was universally acknowledged to be one of the ablest and most competent chairmen that county ever had. His experience in all matters connected with the administration of the criminal law had been immense, and he had always advocated, in and out of Parliament, improvements in prison discipline, and every measure for the prevention of crime and the reformation of the criminal.

Dr. Mouat seconded the motion, expressing hearty concurrence in all that Mr. Hastings had said.

Mr. Hastings put the motion, and it was carried unanimously.

The president, in responding, said that he had been glad to be of any use in promoting the success of the congress. He hoped that the distinguished persons who had come from other countries, and had devoted their high character and ability to the promotion of the objects in view, would reflect with pleasure on what they had seen and heard, and would feel justified in thinking that the purpose of their mission had been as much forwarded as the short duration of the congress could have warranted them in expecting.

PART THIRD.

PAPERS SUBMITTED TO THE CONGRESS.

INTRODUCTORY.

A large number of papers was offered to the congress in the form of essays or discussions of questions connected with penitentiary science and prison discipline. The most of these were by specialists of eminence and ability in many different countries. A few of them were given, in full or in part, as opening addresses on the questions discussed in the congress, and the substance of all such is embodied in the summary of those discussions contained in Part Second of this report. To offer even a full analysis of all the others, however worthy they might be, (and certainly they are worthy,) would swell the present report to an unreasonable length. It was, therefore, necessary to make a selection, and the choice has been determined by some special novelty, either in the subject or its treatment, or by some peculiar characteristic of some other kind, which marked the paper with a special stamp. Another person would perhaps have made a different selection, and in doing so might have chosen more wisely; but this was a case in which it was impossible to consult the judgment of others, and the undersigned was forced to rely upon his own, however great might be the loss thereby occasioned to the reader. Moreover, he has felt obliged to limit himself to a moderate number of the essays submitted, and even these he will be constrained to condense as much as may be without injustice to the writers.

CHAPTER XXIII.

PRISONERS AND THEIR REFORMATION.

Mr. Z. R. Brockway, superintendent of the Detroit House of Correction, and one of the most eminent among the prison officers of America, communicated a paper on the subject which forms the title to the present chapter.

Civilized sentiment (he says in substance) concedes that the protection of society is the main purpose of imprisonment; but effective protection requires one of two conditions: the reformation of the criminal or his continued detention. Hence reformation is the immediate object to be sought. But doubt exists in many minds whether prisoners generally can be reformed, and even prison officers have little hope of this. The writer, however, believes that criminal law may be so reformed in its spirit and administration as to produce a soothing and healing, instead of an irritating and festering, effect upon prisoners, and restore a large proportion of them to society. The species of crime to which a person is addicted depends upon the circumstances which surround him,

or upon inherited tendencies, or both; but whether a man will commit crime at all depends, to a great degree, upon his constitutional characteristics.

Since the welfare of society is the true measure of every man's personal interest, it follows that a criminal act proves obliquity of some kind in the perpetrator—moral imbecility, incoherent mental development, feebleness of will-power. Nor is this to be wondered at, since criminals are so commonly without systematic education, by which alone the moral, mental, and volitional powers can be rightly and effectively trained. All who have studied criminals closely must have observed the undeveloped, incongruous, ill-balanced state of their higher powers, and the consequent sway of the animal instincts. Mr. Brockway says that he has been constantly surprised at the blindness of prisoners to the moral quality of their conduct. This undeveloped state, this paralysis, as it were, of the moral faculties, though, no doubt, largely due to the want of proper early education, he nevertheless believes to be often inherited from progenitors; and he adduces very striking statistics in support of this belief. Now, if there is a common idiosyncrasy among criminals, consisting in the activity of the grosser and more selfish impulses, and in the imbecility or absence of the moral, reflective, or volitional faculties, the writer asks, have we not found the right basis of a reformatory system, whose philosophy may be stated in the one word—*cultivation*?

Mr. Brockway discusses at considerable length the comparative merits of the Philadelphia and Auburn systems of prison discipline, and, while giving his preference to the latter, arrives at the conclusion that no system of imprisonment can regularly produce reformed convicts so long as the present or any like system of sentences prevails. He believes that the true remedy lies in the substitution of indeterminate or reformatory sentences in place of mere time-sentences. His personal experience, from recent legislation of his own State of Michigan, embodying a partial adoption of this principle, is altogether confirmatory of its truth and soundness, and demonstrates beyond contradiction the practicability of its application. He found that it tended to cultivate in criminals a kindly feeling for the law and its executors; and its effect, he argues, must necessarily be to increase for society protection from criminals, either through this continued restraint or their reformation, the latter of which objects cannot fail to be essentially aided by enlisting the active co-operation of criminals in their own improvement.

Mr. Brockway lays down the postulate that any change in the character and life of criminals must be effected by one of two methods: intimidation or education. Restraint by intimidation does not go to the root of matters; it touches only the surface, and must, therefore, be but momentary. Reformation, therefore, cannot be through intimidation; it must of necessity be the result of such cultivation of the mind and heart as is required to give the criminal knowledge and appreciation of the beneficent design and friendly protection of law, to supply better thoughts and impulses, and to invest with authoritative control the mind's legitimate sovereign, the will. The educational effort in prisons, if made efficient for reformation, must be broadly and thoroughly organized; it must be such as to develop and strengthen, not only the mental, physical, and industrial faculties of the prisoner, but also his moral and religious nature.

The effectual reformation of criminals requires: 1, a graduated series of penitentiary establishments, embracing a phase of the separate system, of the congregate silent system, and of the congregate social sys-

tem; 2, centralized control, with guardian care of discharged prisoners; 3, the principle of indeterminate or reformatory sentences; 4, industrial, scholastic, and religious education and culture; and, 5, a better public sentiment on the whole penitentiary question and on that of the laboring classes in general.

CHAPTER XXIV.

CUMULATIVE PUNISHMENTS.

A paper of high practical interest and value on this subject was contributed by Messrs. Clarke Aspinall, Edward Lawrence, and S. Grey Rathbone, on behalf of the Liverpool magistracy, England. They commence by reciting two resolutions unanimously passed by the magistrates, January 17, 1872, as follows: 1, that it is desirable that the cumulative principle be applied to the punishment of all classes of crimes and offenses; and, 2, that it is further desirable that the visiting justices (corresponding to our boards of prison managers) should be empowered to transfer well-conducted prisoners to homes for a short period prior to the termination of their sentences. These resolutions are followed by a table, showing the number of prisoners confined in the Liverpool borough-prison during the first six months of the official year 1870-'71, who had been committed fifteen times and more:

Fifteen times and under twenty.	Twenty times and under thirty.	Thirty times and under forty.	Forty times and under fifty.	Fifty times and under seventy.	Seventy times and upward.
Females 93	121	61	14	14	3
Males 32	28	12	1	4	1

The authors of the paper are strongly of the opinion, in which all reflecting persons must concur, that punishments should be gradually increased in severity, if offenses are often repeated. This opinion is based upon two grounds, viz: first, because long sentences would be more formidable, and therefore more deterrent to persons who had become indifferent to short ones; and, secondly, because such sentences would aid persons who had become addicted to a disorderly or criminal life to abandon it, by giving greater scope to the action of reformatory influences.

When the criminal laws shall have been amended in the direction indicated, so that terms of imprisonment of considerable duration are imposed on habitual petty transgressors, it is the opinion of the writers that the prison authorities should have power to transfer any prisoners, under proper limitations, to any home which is willing to receive them, and is at the same time under the management of a certified discharged prisoners' aid society. The advantage of such an arrangement would be that well-conducted prisoners could be selected and placed in such homes for some time prior to their discharge, in a state intermediate between the stringent restraints of the prison and perfect liberty. In such a state they would have better opportunities than can be afforded in a prison of exercising and acquiring habits of self-control, and of earning such a character as may facilitate their

obtaining an honest living when discharged. Several homes for adult discharged prisoners (the authors of the paper say) have been established, and, if successful, more would no doubt be opened by voluntary effort, and the expenses of adult prisoners would not be large, if the homes were well managed and placed in situations favorable for the profitable carrying on of the industries in which their inmates were occupied. The prisoners, knowing that if they did not work well, the managers of the homes would return them to the deprivations of a prison, *would have a potent stimulus to real industry*, for it would of course be one of the conditions of the transfer of a prisoner to a home that, if he or she became idle, disorderly, or discontented, the prisoner should be returned to prison for the remainder of the sentence. The writers suggest that the homes should not be largely, if at all, subsidized from public funds. Their utility will depend much on the labor in them being of the genuine kind, which would render them to a great extent self-supporting, and all or most of the deficiency should be raised by the managers, as a guarantee that they are really interested in the work. It would be far better that the growth of such homes should be slow and gradual, as the fruit of satisfactory experience, than that they should be prematurely forced into existence in large numbers by such liberal public grants as have been given to reformatories and industrial schools.

If the proposed amendments in the law were made, it is believed that the following results might be hoped for:

1. That the short sentences passed on young offenders would become much more deterrent, because they would be known to lead up to the really long sentences, which are unquestionably much feared by nearly all the criminal classes.

2. That under the influence of long detentions, when they became necessary, (particularly if part of the time were passed in well-regulated homes,) a certain proportion of the offenders would be reformed.

3. That the residuum of reckless incorrigibles would be detained in prison under a succession of long sentences instead of a succession of short sentences, from which the great advantage would arise that they would have fewer opportunities of committing crimes themselves and of training up others in bad ways, while the expense of their imprisonment would not be materially, if at all, increased, since the labor of long-time prisoners can be made profitable to an extent quite impossible in the case of short-time prisoners.

4. That the power of the police to enforce order and decency in the streets could be supported by the magistracy far more efficiently than under existing laws.

CHAPTER XXV.

THE TREATMENT OF PRISONERS.

The right honorable Sir Walter Crofton offered a valuable paper under the above caption. He lays down the proposition that the end of punishment is twofold: amendment and example. But it is difficult to embrace both these requirements in a system of prison discipline. A system of natural training from the start might amend individuals and reconcile the public to their employment on discharge; but how would

such a system prove exemplary to others? An artificial system, carried through from the beginning to the end, would be an example to the criminally disposed; but would such a system reform prisoners and further their employment on their release?

Reflecting upon these things, when called to preside over the convict-department in Ireland, he was led to discard each of these plans as a system complete in itself, for he felt that they would fail to attain the object in view, but that, as component parts of one system, definite and distinct in their several arrangements, both plans might be beneficially employed, and the one made so to lead up to the other as to give to the whole, in the mind of the criminal, the felt aspect of amendment. But in order to attain amendment, you must gain the co-operation of the criminals, to effect which they must realize that their punishment is not *merely retributive*, but that it has a benevolent aim, and that this aim is to improve them.

Long experience has enabled him to state that if this point is made sufficiently clear to the mind of the criminal at the commencement of the sentence, it will not be in hostility to those placed over him, even in the necessarily penal and more stringent stages of his punishment, for he will "look to the end," and hope will be ever present with him.

The solution of this problem, to his mind, lay in a classification which should lead, by successive stages, from very great strictness to a state of semi-freedom, in which the reformation of the criminal might be satisfactorily tested through the absence of the artificial restraints necessary in the earlier stages of detention.

To give to these stages in classification real value, it was necessary that self-control and self-denial should be developed in the process. To attain the object in view, the idle and ill-disciplined should become industrious and orderly. No plan could so well effect this result as marks, (introduced into Ireland in 1854,) or numerical records of labor.

But without associating industry in the minds of criminals with profit and pleasure, the marks would not be gained, and the end in view would be lost. As a general rule, it may be assumed that the criminal classes dislike labor. But if labor is made a *privilege to be earned* by its absence in the very earliest stages of seclusion and by its gradual introduction, coupled with other advantages as classification advances, it will by degrees, *slowly perhaps at first, but surely*, supplant idleness in the majority of criminals.

Those conversant with the plan of convict treatment introduced into Ireland in 1854 will at once perceive that the principles of prison training just sketched formed the basis of the system.

So far as the prison discipline of the system is concerned, we have, then:

1. The stage of penal and stringent discipline.
2. The stage of associated labor, (with separate dormitories,) in which, by means of progressive classification governed by marks, the industrial improvement and self-control of the prisoner are both stimulated and tested by the motive power which is at work, viz, improvement in present position and the opportunity of obtaining earlier liberation. It will be at once realized that thus the criminal, within certain defined limits, becomes the arbiter of his own fate, and the system is deprived of any aspect of vengeance, while it secures the co-operation of the prisoner in his own improvement. It is scarcely necessary to point out the self-drilling which is required under such a system, if the advantages held out by progressive classification are to be reaped.

When these two stages are satisfactorily passed—*i. e.*, when the crim-

nals have attained the required number of marks to entitle them to the privilege—they are removed to a stage of semi-freedom, called the third or intermediate stage, which is a stage of probation in a more natural state of training before liberation.

This stage of natural training in its very nature prepares the criminal for his return to the ordinary avocations of free life, and reconciles the public to his employment. As it has had the test of sixteen years' experience and has more than fulfilled what was expected from it, it must be looked upon as a great success. The conduct and industry of the inmates during this long period have equaled, and even exceeded, those of ordinary laborers in similar positions of temptation.

Sir Walter believes the above to be the best prison training to prepare a criminal for his release and his re-absorption into society. It is a training so simple in its principles that its very simplicity formed at one time its great stumbling-block in the minds of men, and so easy of application that, in some form, it is suited to every locality and every human being.

CHAPTER XXVI.

PREVENTIVE POLICE ORGANIZATION.

Mr. Edwin Chadwick, C. B., of England presented to the congress a paper of much ability and breadth on the question of a preventive police. One great object (he says) of a compulsory system of public relief for the destitute is to disarm the mendicant of his plea that, unless alms be given him, he must perish. Juvenile mendicancy leads to juvenile delinquency, and both are fed by indiscriminate alms-giving. English prisons were, at one time, filled chiefly with delinquents' orphans reared in mendicancy, who from begging advanced to stealing. Juvenile vagrancy and juvenile mendicancy are the great seed-plot of adult habitual criminality. Most of those who follow stealing as a business have mainly entered their careers as juvenile vagrants and mendicants. After having, with the aid of able colleagues, completed a report on a compulsory system of relief to the poor and after considerable experience in administering such a system, Mr. Chadwick became convinced that to attain the object of the law in regard to the great evil of vagrancy and mendicancy, as well as for other purposes, the concurrent action of a police was necessary. But beyond the metropolis there was no force in existence deserving the name of a police force. He therefore suggested to the government the expediency of instituting an inquiry into the subject. The result was that a royal commission was created for that purpose, consisting of himself, Colonel Rowan, chief commissioner of the metropolitan police, and Mr. John Shaw Lefevre, M. P. The leading results of this inquiry were embodied in Mr. Chadwick's paper, and submitted for the information of the congress.

The commissioners found, in the first place, that the gains of habitual criminals, as a rule, greatly exceeded those obtainable by honest industry, being in fact, on an average, about double. In the next place, they found that their average careers of spoliation upon the community, without interruption by arrest and conviction, were about five years in duration. More recently the estimate is that habitual depredators spend about one-third of their time in prison, and the other two-thirds at large,

plying their craft. The duration of these long careers of uninterrupted villainy are owing mainly to two causes: first, to the adroitness of the criminals; and, secondly, to the fact that the party robbed generally discontinues the prosecution on the restoration of the property.

Instances of the reformation of habitual thieves were unknown, and the possibility of such reformation was not believed in by the police. But proof was given that careers of habitual depredation had been discontinued because of difficulties which reduced the chances of escape and rendered such depredation less gainful than honest industry, as, for instance, highway robbery by mounted and armed horsemen. Evidence was given that there were house-breakers who had returned to honest occupations since the institution of the police, because the chances of escape had been so far narrowed that the business no longer paid. But if the chances of impunity were again lengthened from months to years, highway robbers, on foot and mounted, would re-appear, even though the gallows and the gibbet should re-appear with them. What is wanted, therefore, to check criminality, so far as objective agencies are concerned, is, not severe punishments, (these have little effect,) but few chances of escape, certainty of detection, short careers out of prison, and a reduction of the profits below those of honest industry. To leave the chances wide open, the careers long, and the profits large, and to rely mainly on punitive agencies, would be a wisdom akin to that of directing effort to the cure or alleviation of marsh-diseases and leaving the marshes undrained. The whole mass of habitual depredation exists through the defects of repressive legislation, and especially through the want of a properly-organized and systematic pursuit by an effective police force.

But the efficient action of a police depends upon the completeness of its information, and this again upon the effective co-operation of the public in supplying it. The commissioners found that the police are very incompletely informed of the number of depredations committed. They also found that the failure of the public to co-operate was owing in some degree to carelessness and a low morality, but much more to: 1, a dread of trouble and vexation arising from the cumbrous forms of penal procedure; 2, the absence of systematic public prosecution; and, 3, the fact that the charges of prosecution fall mainly on the party robbed, and this in addition to the loss and annoyance caused by the depredation. It hence follows that, for the efficient action of a police and a close and successful pursuit, a considerable reform in penal law and administration is necessary, as well as a more general and generous public support.

The chief objective points of a police are to render it difficult and laborious to get at property, to render it difficult and laborious to convert property when obtained, to render it difficult to escape detection; and in this way to narrow the chances of escape to the depredator, to shorten his career of impunity, and to reduce the profits of the career below those of honest labor. When these ends are attained, particularly the last, the predatory career will be abandoned. Crime for profit has subsisted and continues to subsist by the absence or inefficiency of systematic organization, devised with a view to detect and punish it.

The remaining portion of Mr. Chadwick's paper is mainly taken up with an account of the state of things in England and the reforms needed there, and has, therefore, little more than a local interest. He closes his essay with the statement that the first report of the commissioners was directed to the elaboration of the principles of the organization of a *preventive police force*, and that the said report has served very much

as a text-book for some of the imperfect organizations that exist, and that they have the material for a second report on the *preventive action* of a police when organized. It is much to be hoped that their second report will not be long delayed.

CHAPTER XXVII.

CRIMES OF PASSION AND CRIMES OF REFLECTION.

Rev. Dr. Bittinger, of the United States, submitted a paper to the congress treating of crime under the twofold aspect indicated by the title which forms the subject of the present chapter. The discussion was one of great originality, sharp analysis, and, withal, of a highly practical cast. The undersigned cannot but regret that an essay of such value should not have been given in full. But the respected editor of the Transactions, whose prerogative it was to decide upon questions of that nature, has inserted in his volume only a short abstract, and with that the undersigned must be satisfied. Dr. Bittinger's view, as epitomized in the Transactions, is, in substance, as follows:

Sin is the primal cause of lawlessness, but it is not amenable to human legislation until it finds expression in criminal acts. The two factors of crime are passion and reflection. The passions differ both in kind and degree: they are malign and non-malign. Reflection differs only in degree. Crime is punishable, because it injures society. The character and degree of the injuriousness of crime must determine the nature of our penal legislation; and the possibility of diminishing crime and reforming the criminal must determine the nature of our penal treatment. The enormity of criminal acts is modified by their relation to the person of the victim as nearer or more remote. Thus murder, rape, mayhem, malicious mischief, arson, and robbery have a closeness of relation to the person corresponding to the order in which they are named, and the same order marks the degree or intensity of guilt which attaches to the several acts. Another distinction to be made, which has been already alluded to, is between crimes of passion themselves, namely, crimes of malign passion, as murder, and crimes of non-malign passion, as rape. Acts springing from malign feelings are always criminal, while those springing from the non-malign passions are criminal only in their excess. The malign passions are in their nature objective, being always aimed at the person, as murder, mayhem, malicious mischief. The non-malign passions are, in their nature, subjective, their aim being ever the gratification of one's self, and not harm to another. The former are personal, the latter impersonal. The punishment of crimes of passion is aimed at the quality of the passion, as malign or non-malign. The punishment of crimes of reflection is aimed at the degree of reflection, as involving more or less of intelligence and purpose. Personality, as being that which tends most to excite and intensify reflection, is, in general, the measure of the offense as regards its guilt: larceny of detached property, pocket-picking, burglary, robbery, rape. The nearer the criminal gets to the person, the darker is the crime and the sterner should be the punishment. Crimes of passion are to crimes of reflection as 1 to 27. The most inveterate crimes of reflection are the following: Horse-stealing, burglary, robbery, forgery; and this is the order of their frequency as well as of their guilt. Of crimes of passion the order is murder,

rape, felonious assault. Statistics show that grave crimes of passion do not tend to repetition, while crimes of reflection tend strongly in that direction. Hence, crimes of passion are few, of reflection many.

For crimes of passion, preventive legislation is the remedy—

1. By improving the condition of the poor and degraded through work, education, and moral instruction and culture.

2. By protecting all classes through laws against drunkenness, gambling, and prostitution.

Crimes of reflection demand repressive and deterrent legislation—such as a vigilant police, certain detection, and swift punishment.

The penal treatment of both these classes should be framed on justice, as opposed to vindictiveness. Criminals have rights which justice must respect. The moral character of the jailor is of prime importance. The jailor and the judge are equally the ministers of justice. The prisoner's sense of justice must be respected by those who are charged with administering punishment, or his punishment will neither deter nor reform him. In dealing with professional criminals, justice may fitly be made to wear an aspect of severity, or at least of sternness; in dealing with crimes of passion, there should be a leaning toward mercy. The victim of passion is to be pitied; the criminal of reflection is to be punished. The man who does criminal acts under a sudden assault of passion leaves room for hope, for cooler moments turn him against himself and move him to repentance; the man who deliberates and plans his crimes is comparatively hopeless, because coolness is the essence of his criminality. The one is overtaken by crime; the other elects it. Criminals of passion have no accomplices, but often witnesses; criminals of reflection have accomplices, but seldom witnesses. The former rarely combine, and are without organization; the latter form themselves into communities, and organize for crime.

These characteristic differences between the two classes of criminals demand a corresponding difference in criminal legislation and penal treatment. Dr. Bitteringer in his essay explained why and wherein this difference of legislation and discipline, as applied to them, consisted. But the abstract in the Transactions ends at this point, and the undersigned is consequently unable to follow him further.

CHAPTER XXVIII.

JOHN HOWARD—HIS LIFE AND SERVICES.

John Howard entered upon his career as a prison reformer in the year 1773. It was therefore fit that an international penitentiary congress, convened in England ninety-nine years after that date, should be made the occasion of a centenary commemoration of the great English philanthropist. By special request, Rev. Henry W. Bellows, D. D., of the United States, delivered, during the sittings of the congress, a discourse on his life, character, and services, which was a worthy tribute to the man and the cause. The address of Dr. Bellows fills sixty pages of the volume of printed Transactions; it is evident, therefore, that the brief extracts to which the undersigned feels constrained to limit himself can give but a meager idea of the masterly analysis and glowing eloquence of the distinguished orator.

In one of the opening paragraphs of his discourse, Dr. Bellows thus speaks of its subject:

The name of Howard has become a synonym of philanthropy. It is more widely known, and known with more unqualified praise and honor, than any private name in modern history. Hundreds of associations for charity and beneficence have chosen it for their title. It has passed out of the keeping of his own countrymen into that of mankind. The lips of little children learn it almost next after that of their divine Master. Its glory belongs to neither sex, but celebrates virtues and graces equally honorable and acceptable in both. It is one of the few names religion dares to repeat in connection with her holiest themes. There is scarcely a shadow upon it. It mingles with all that is purest, noblest, most celestial in human feelings. It overleaped, even in the days of angry polemics, the walls of sect, and acted as a solvent of bigotry and a cement among theological rivals and antagonists. It stands for universal mercy, world-wide sympathy, and absolute consecration to human service. A name for mildness, self-forgetfulness, sleepless activity in benevolent work, for interest in the most abandoned and repulsive of our species, for hope toward those despaired of by all others, for chivalrous and heroic daring against enemies more perilous than artillery, but from whom even wisdom had accounted it universally permissible to flee—pestilence and crime; a name for humility which fled from the echoes of its own resonant goodness, wept at the praises it could not escape, and unaffectedly longed to be unknown. What a halo hangs around these syllables! Howard! If, as he himself declares, not one insulting word or disparaging and contemptuous act ever met his eye or ear in the sixteen years of his pilgrimage among the reprobate class confined in the prisons of all Europe, a hundred years, in which that name has circulated like a household word through the homes of civilized man, have hardly produced one jar or discord in the universal symphony of love and praise.

In the following sentences Dr. Bellows gives us Howard's own account of what first awakened his interest in prisoners and led him to a visitation of prisons:

Howard says that the first circumstance which excited him to activity in behalf of prisoners was in observing, when sheriff of the county of Bedford, that persons accused of crimes, but on trial found *not guilty*, or against whom prosecutors failed to appear, after having suffered previous to trial or arraignment months of unjust imprisonment, were often dragged back to jail and locked up until they should pay *sun-dry fees* to the jailer, clerk of assize, &c. He represented the hardship to the court, and begged that the jailer should have a salary in place of fees. The court was moved with the justice of the suggestion, but wanted a precedent for charging the county with the expense. Howard rode into several counties in search of a precedent, and his failure to find one did not prevent him from discovering the general sufferings of debtors and felons in all the prisons he visited, and waked up an earnest desire to alleviate what excited his pity and offended his sense of justice.

Dr. Bellows describes the zeal, activity, minute diligence, and scrupulous conscientiousness of Howard, in these words:

Howard had now become unsparing in the demands he made on his own diligence; he gave himself barely time to attend to his private obligations. He regarded neither distance, labor, nor expense in his investigations. Hundreds of miles, by post, on horseback, by night and by day, he hurried through England, Wales, Ireland, Scotland, the Isle of Wight, ubiquitous, making almost superhuman haste, and yet overlooking and forgetting nothing. A jail with one prisoner was important enough to draw him frequently to its inspection. He took nothing on hearsay; made no rough generalization; exposed himself boldly to jail-fever, small-pox, typhus, and every personal trial to which delicate sense or humane feelings can be subjected, that he might be able to speak with unanswerable authority on a subject which he had perfectly exhausted. Let us remember that this was not a time when immense accumulations of facts, exactly observed, had taken the place which they now possess, even in the physical sciences, much less in the moral. Howard's hunger for facts was unexampled in his time. He anticipated even scientific observers in rigor, exactness, hesitation to generalize, and patient waiting for an exhaustive examination of the field. This was partly due to the want in him of a discursive understanding or tendency to generalizing; the absence of a lively imagination and an intuitive perception; but still more to the scrupulous conscientiousness of his character, his inability to tell lies of carelessness, his plodding patience and utter self-forgetfulness in the pursuit of his ends. It is hardly too much to say, then, that every prison, bridewell, house of detention, sponging-house, in the three kingdoms, and every apartment in each of them, and every individual prisoner in every cell, had by this time been under his inquiring eye and had felt his influence. The whole race of prison keepers and jail authorities, as well as all the felons, convicts, and debtors had seen his face and felt the genuineness, the authority, and the strength of his purpose. What other man has made his personality for so many years so directly felt by the very persons for whose improvement and reform he was laboring? Asso-

ciated beneficence, deputed and vicarious sacrifices for the vicious, organized corporations for charity and for reform—we all know their necessity, their advantages, and their power. But do we not also know their limitations, their dangers, their exposures to superficiality and perfunctory work, their tendency to become at last only costly machines, run largely or mainly for the sake of the officers who administer them? John Howard was a sublime exception to the rule which trusts more to the machinery than the power that drives it; to the wheels, than the spirit in the wheels. His personal labors were as abundant as his public reports were few and far between; his inquiries as minute, special, and particular as they were numerous, broad, and universal. He swept the whole field, but it was as carefully as if it had been only a single threshing-floor.

This account is given of Howard's first publication of his work on the State of the Prisons of England and Wales, with Preliminary Observations, and an Account of some Foreign Prisons and Hospitals:

Never was so original and costly a work—costly in the personal sacrifices and severe labors it represented, original in being the record of one observer's personal study of a subject hitherto treated only in the library by philosophers like Montesquieu and Beccaria—issued with less pretension. Printed at the author's expense, in a provincial town—and, it may almost be said, without a publisher—given away mostly by Howard himself, it came out, without the smallest flourish of trumpets or the least aid from an expectant public, carefully manipulated by such a skill as now ushers works of importance into the reading world. And it was as modest in its pretensions, restrained in style and statement, free from rhetoric and false sentiment, as if it had been a legal document. Howard had a perfect eye for facts. He saw them, too, in a true perspective. He hated sentimentality and romance almost as he did falsehood. He was incapable, even had he been desirous, of arranging his observations in a pictorial or dramatic form. His work, therefore, is a plain, straightforward, condensed narrative of his observations upon the conditions of all the prisons he visited, with little generalization, no philosophy, and few other comments than those of a plain, practical man. But the vast accumulation of facts exhaustive of the subject is fitted to produce an effect which no abstract and no general inferences could possibly have accomplished. He really makes his reader a fellow-traveler, and, by inspiring him with absolute confidence in his scrupulous conscientiousness as an observer and recorder, he feels that his impressions from the book are nearly or quite equal in freshness and force to those an actual circuit of all the prisons in England and Wales, and of most in Holland, France, and Switzerland, would have produced. It may almost be said to have been the first successful attempt to arouse public opinion, independent of class or order, to a concern, on grounds of justice and humanity, in the treatment of a large and repugnant class of our fellow-men. It has become so common since, that the originality and boldness of Howard's course are not fully appreciated. Prior to that time, the appeal of all social reformers had been to scholars, philosophers, statesmen. Howard addressed the ordinary intelligence of tradesmen and the great middle class. He did not shoot an inch above their heads, and still less above their hearts. The narrative form of his book adapted it to its end, and nothing but its cumbrous size and cost prevented it from a still wider circulation.

Such self-denial, such purity of purpose, such self-subsistent efforts as Howard's could not but give an apostolic character to his reputation, disarm criticism, and almost place him and his work outside the common arena of judgment. It is not too much to say that his personal character, as exhibited in his work, was itself almost a new revelation of humanity; and so moved and amazed England, that the suggestions and wishes of such a working saint needed hardly any support except its own sublime simplicity and unparalleled devotion. Martyrs dying in the cause of religion the world had known, and soon failed to reverence. But saints living through labors and dangers and sacrifices such as Howard encountered, to soften the lot of the most degraded and opprobrious class of human beings—felons and murderers, thieves and robbers—and that without regard to country, race, creed, color, and at no possible advantage to himself—at his own risk and cost, and without any warrant or authority but his own will: this had made an impression on the English public which was unique, complete, and without deduction. And it is no wonder that Howard's work, though its circulation was necessarily limited, should, by the aid of citations in the public press, have created what came, as near as the condition of England then allowed, to a universal interest.

The concluding paragraphs of Dr. Bellows's address contain what may be called at once a comparison and a contrast between two of the most eminent and remarkable men of the eighteenth century. He says:

There are two characters belonging to the last century who may be said in different ways to have left a stronger impression on the world than any other two men of

their time, who were not connected with political, scientific, economic, or literary affairs; both Englishmen, both cosmopolites, and both originators of movements that have swept over the whole face of the earth, and drawn the admiration and sympathy of successive generations to their respective undertakings; both men whose influence continues and increases, and who have taken their places among the permanent ornaments and benefactors of their race: John Wesley and John Howard. Wesley the elder was born in 1703 and died in 1791. Howard was born in 1726 and died 1790, one year only before his great contemporary. They resembled each other even in person, both being men of light weight, spare, under-sized, and of ascetic and self-denying habits. Both were men unconformed to the world, and living habitually in view of another state of being; both intensely religious and Christian in faith and temper; both eaten up with a zeal for the welfare of their fellow-creatures; both self-subsistent and self-relying men, so far as dependence on human sympathy is concerned. Both were men of immense powers of work, who never spared themselves when personal sacrifices of ease, sleep, food, society, friendship, could advance their unselfish aims. Both possessed unflinching courage, and met the prejudices, passions, and perils of unpopular causes, and of rude and violent classes, with the firmest, calmest, and most controlling will. Both were equally marked by invincible convictions, a single and undeviating aim, an indomitable resolution which success could not intoxicate nor opposition tame. Both were practical men of great executive ability, aiming at clear and definite ends, with clear-cut purposes, and little embarrassed by speculative misgivings, self-distrust, or deference to others' opinions. Both relied mainly upon their own personal judgment, their own personal exertions, their own self-sacrificing spirit and labors for their success. Both were intensely protestant in their principles and intensely papal in their sense of infallibility—men who could only lead, not follow; govern, not obey. Both were wholly consecrated to their aims, above the temptations of riches and honors; holding pomp, place, ostentation, ease, money, applause, in contempt, and freely spending all they possessed or created, at the service of the needy. They both lived on horseback, and were, in an age of obstructed intercourse, ubiquitous—traveling by night and by day, with a speed practically equal to that which even modern facilities afford to self-indulgent travelers; careering through these three kingdoms, and into the remotest parts of the islands, in a way to make themselves equally at home in city and hamlet, among the rich and the poor.

Wesley is computed to have journeyed a quarter of a million of miles on his voluntary itineracy, chiefly on horseback; and Howard probably traveled in the same way, in a life twenty years shorter, half as far. But what he lacked in miles was made up in the variety of the countries he visited, the scope of the circuits he made, the character of the obstacles and perils he encountered, and the solitary nature of his pursuits. Considering that his public work was confined within sixteen years, was begun in middle life, and ended at the natural period of human existence, he perhaps exceeded in the intensity of his labors and sacrifices, for the time he was engaged in it, any equal period in Wesley's laborious life. But Wesley began his work at twenty-six, and continued it to eighty-eight, with almost equal spirit and activity from the beginning to the close—an unexampled miracle of toil and persistency.

Wesley encountered personal passions, hatred, scorn, violence, ignorance, and contempt; was pelted with stones and garbage, with lampoons and polemic abuse; had knives and pistols drawn upon him; encountered mobs and soldiery; was in frequent danger of his life. Howard faced dangers more fearful to brave men: jail-fever, pestilence, plague, and the apathy of all the best portion of society. Mobs and persecution might have supported his courage by the anger and defiance they rouse, but he needed no such stimulants. He was brave, without witnesses or visible enemies, without excitement or organized opposition; not braver than Wesley, for who could be? but as brave under more depressing circumstances. Wesley's weapon was his tongue, cloven with the flame of the Holy Spirit. With it alone he carved his way through all opposition, calming tumultuous mobs with its spell; subduing violent and wicked spirits with its divine meekness and power, and converting, like the first apostles, thousands in a day. And what his never-silent nor weary tongue did not accomplish, his ever-active pen did—keen, plain, with less ink and more blood in it than any pen that ever wrote so much—a pen that uttered things, not words, terse, unornamented, wholly to the purpose, vigorous, and decisive. Howard had no cunning in his tongue nor in his pen; not a man of thought nor of words, but a man of action; his weapon was an eye to see, to search, to penetrate to the very bottom, to pursue into every hiding-place the evil and curse that had aroused his mingled sense of justice and humanity. He hunted down the prison wrongs of the world with the chivalric devotion of a Spanish knight or the spirit of Sir Lancelot in solitary pursuit of the Holy Grail. He collected facts with the zeal, the labor, and the patience of a modern Darwin, in solitary explorations in distant countries whose tongues he did not speak, and from the deepest dungeons, the most poisoned plague-spots, the dreariest and most hateful holes, in which the moral and social fungi, whose natural history he sought, were to be studied and described. Slow and deliberate, cautious and intent, he spared no

pains, he shunned no dangers, he left unturned no stone, he hurried to no conclusion; he repeated his observations, examined and re-examined his facts; and then, without art, circumlocution, rhetoric, or self-display, mainly by the aid of others, laid them calmly before the little world who then read books, and left them to work their effects.

Wesley was an organizer of the first order. He knew how to win, how to hold, and how to use other men. Solitary in plan and purpose, he was eminently social in method and co-operative in means. He builded as fast as he collected materials. It was no disembodied, uninstituted work, the diffusion of ideas as a spirit, that occupied his formative and shaping brain. He was a churchman in every fiber, and he aimed at visible, methodic ends—the great methodist, who swept thousands of the ablest and most earnest souls of his generation into the ranks of his cause, organized them with an almost military drill, uniformed them with precise opinions, badged them with similar phrases and methods, and left them a distinct corps in the church militant, with a polity of their own, to make conquest at last of twelve millions of people, who are destined to multiply into scores of millions before the life Wesley gave them has found any superseding rival or absorbent. Howard was a prophet, and not a priest; a prophet of action, no organiser, no founder; an impulse; an example; an alarm-bell; a trumpet heard in the night. He was a sort of John the Baptist, his meat locusts and wild honey, crying in the wilderness, repent, repent. Solitary, difficult to work with, and wholly lonely in labors and in aims, he built up no work, he laid the foundations of no scheme, he became the architect of no system. But he drew the attention of the world and fastened it upon the cruelties, the inefficiency, and the inhumane and unchristian character of the dark prison territory. Nay, by his exalted devotion, the noiseless enthusiasm of his labors, the purity and intensity of his zeal, his absolute, uncalculating humanity, he made his name not only a landmark but an inextinguishable voice, which has ever since sounded through the nations, demanding attention to prisoners' rights and claims. He who can thus gild his own name with mercy and truth, until it shines over all lands with the glory of an unsetting constellation, who can turn its very letters and syllables into a universal language, until it becomes a spell, a synonym for humanity, a rally for the prisoner's relief, has joined the small company of the immortals in human history, and is among the saints, apostles, martyrs, who stand nearest to the Head of the glorious company in heaven.

CHAPTER XXIX.

THE PRISON OF GHENT.

M. Auguste Visschers, a jurist and philanthropist of great distinction and ability, was one of five commissioners named by the government to represent Belgium in the congress of London. Forbidden by his physician, on account of the state of his health, to leave home at the time of the meeting of the congress, he communicated in print a paper entitled, "Notice relating to the construction of the prison of Ghent, decreed by the States of Flanders in 1771, and to the two memoirs drawn up by the Viscount J. P. Vilain XIV, on the subject of the establishment of the said prison in 1771–1775, followed by some considerations on the progress and development of the penitentiary system." No more interesting or instructive paper was offered to the congress, yet, by some unaccountable oversight—for certainly there could have been no such design—it does not appear, nor is any allusion made to it, in the volume of Transactions issued by order of the body and edited by its secretary, Edwin Pears, esq., under the supervision of an English committee appointed for that purpose. For this reason, and because of the exceedingly interesting character of the information offered by M. Visschers in his historical essay, information so honorable to his country and to one of its eminent citizens, the undersigned has deemed it fit and desirable to give in the present chapter a somewhat extended summary of its contents.

M. Visschers divides his paper into seven sections, or, as he names them, chapters, each treating of a special department of his subject.

The first section treats of the state of society in the Belgian provinces, near the middle of the eighteenth century, and of the imperfection of its repressive laws. The author says that at this time the whole of Europe was desolated by the scourge of innumerable mendicants and vagrants, a scourge which the laws and customs rather encouraged than repressed. That enlightened and able Empress, Maria Theresa, moved by this state of things, sought to introduce remedial measures more effective than those previously employed. A letter of Prince Charles of Lorraine, governor-general of the Austrian low countries, dated August 2, 1765, called the attention of the privy council to the abuses existing in the administration of criminal justice, and particularly to the inefficacy of the punishments of whipping, branding, and banishment for the repression of crimes. M. de Fierlant resumed the discussion of these questions in the session of the privy council of April 13, 1771. He denounced infamous and torturing punishments, and advocated, instead, the immediate establishment of houses of correction, declaring that people without honor could not be restrained by the fear of infamy; that neither the scaffold, nor the scourge, nor the branding-iron could ever put an end to disorders which had their source in a dislike of work, and that the only means of correcting the indolent and the idle was to compel them to labor. M. Visschers cites two state papers of the Empress Maria Theresa, honorable alike to her intelligence and her humanity, in which she recommends the gradual abolishment of capital punishment, except in cases of atrocious crime, and the establishment of correctional prisons to take the place of these punishments. He mentions also another letter of Prince Charles of Lorraine, under date of May 11, 1772, pressing the work of building the prison at Ghent, agreeably to the plan of the Viscount Vilain, with separate cells for each prisoner, that it might serve as a model and an incitement to the other provinces.

The second section touches briefly on the principal events in the life, as well as on the more important writings, of the founder of the house of correction of Ghent, the Viscount J. P. Vilain. Born at Ghent in the year 1712, this great man passed through all the gradations of public honor and responsibility in his native country, ever showing himself able, wise, and faithful, and closed a career, at once useful and illustrious, in 1777, at the age of sixty-five years. His works were chiefly memoirs or essays on finance, economics, and penitentiary science, all of a practical character, all marked by broad common sense and a keen insight, and all intended to promote the highest interest and welfare of the state.

Section third enters into the heart of the subject, giving a most interesting *résumé* of the two memoirs of the Viscount Vilain, in 1771 and 1775, for the construction and internal arrangement of the house of correction. The first presents the basis on which the new establishment was to be founded. The second is mainly taken up with setting forth the rules and regulations of the house. In the former the viscount maintains that mendicity and vagrancy are encouraged and fostered by the hospitals and alms-houses intended for their relief and prevention, and that they form the seed-plot and nursery of theft and robbery. Of 64,681 paupers then found in Flanders, exclusive of the cities, fully one-half were able-bodied mendicants, imposters, vagabonds, wandering from village to village and committing all sorts of spoliations upon the honest people of the country. He says that for such offenses there were no punishments between fines and tortures, and asks why it would not be better to make of these sturdy beggars workmen useful to the public before

they became criminals. He then examines the question of cost, and concludes that the proposed house of correction would be an economic measure as compared with the expenses of justice and the losses occasioned by the spoliators.

The proposition received the assent of the states of Flanders and of the Empress Maria Theresa. It was determined, according to the recommendations of the viscount's report, that there should be a separate ward for able-bodied mendicants, a second for women, a third for laborers out of employment who desired work, and a fourth for the children of paupers. It was ordained, not only that there should be a separate establishment for each of these classes, but that each individual should be confined separately at night. The first three wards, radiating from a common center, were erected in the year 1772-1773, and provisional regulations for the discipline were decreed in February, 1773; but the general opening did not take place till May, 1775.

After two years' experience the Viscount Vilain presented to the states his second memoir, in 1775. The first was intended to prepare for the creation of the establishment, the second to consolidate it. In it he remarks that the punishments inflicted on the bandits who caused the honest laborer to tremble—exile, whipping, branding—effected no improvement in them, and were a remedy for nothing. The offenders rather grew worse. He believed it would be preferable to change these punishments to correctional imprisonment. There was, however, a peril to which the new experiment was exposed, that might prove disastrous; it was that of having too great a number at the beginning. Provision was made against this danger by the resolution to receive only a limited number, and to increase it when the first comers should be reformed and inured to labor.

The fourth section describes the plan and interior division of the house of correction of Ghent. The general plan was that of wings radiating from one center, five of which were completed in 1775 and the remaining three not until 1827. The first wing on the left, as you enter, was alone at that time used as a prison for criminals. The second was occupied by able-bodied beggars, misdemeanants, and disorderly persons. The third was appropriated to girls and women. The other two were destined to the reception of persons in want of work and to the children of paupers received on foundations or scholarships. Each wing had four stories, with stairs and the necessary private entrances. The whole structure was surrounded by an inclosing wall. Each prisoner was confined in a separate cell at night. The criminals' wing had two hundred and eighty-four cells, each seven feet long and five and a half wide. They were all of the same form and proportions, and all provided with the same furniture, viz: a bed six and a half feet long and two and a half feet wide, a paillasse, a mattress, a pillow, a pair of sheets, and two blankets in winter and one in summer. They were also provided with a vessel, a small bench, a hinge-table, and a closet in which the prisoners kept their effects. The ground-floor was occupied partly by the work-shops and partly by dark cells for the punishment of faults against discipline.

On the first story was the kitchen, with its adjuncts. The refectory, which was contiguous to it, was one hundred and twenty feet long and twenty-six feet wide; eighteen tables might be spread in it, with twenty covers each.

In the chapel adjoining the refectory was celebrated, Sundays and feast-days, divine service, at which all the prisoners were required to

be present, as well as at the sermon, and at daily prayers morning and evening.

The second structure, designed for able-bodied beggars and prisoners sentenced for minor offenses, was built and arranged in the same manner, with separate cells for two hundred and fifty.

The third wing, appropriated to young girls and women, was of the same dimensions, containing eight large apartments twenty-two by sixteen feet, and forty smaller ones, ten and a half feet in length by eight and three-quarters in breadth. The refectory for the women was of the same proportions as that for the criminal men.

The two remaining wings, and the three still to be constructed in order to complete the octagon, had a destination which attested the breadth of the views which presided over the conception of the plan. For the realization of the end proposed, it was expected that there would be a foundation of four hundred to five hundred scholarships, yielding annually 60 florins each. Already the states of Flanders had resolved to contribute to this foundation by establishing twenty scholarships. It was proposed to establish in the house of correction schools for the children of the poor and for apprentices in general, who, for want of sufficient means, were unable to acquire the knowledge of trades.

The broad views and large-hearted humanity of the Viscount Vilain are shown in his declaration that "this establishment ought to be looked upon by the public as a school or nursery of arts and trades for the relief of the really poor, who, deprived of resources sufficient to support their children, are obliged to let them languish in idleness and to make of them beggars, who, as a consequence, become onerous to the public and useless to the state."

To encourage this plan, the Empress decreed "that those who shall become most capable as workmen, shall be received into the trade-corporations of the towns of Flanders which they shall find convenient to their locality, without charges of any kind, and without being subjected to years of apprenticeship, but only to the production of a trial-piece, and that, in addition, they shall enjoy the rights of citizenship (*bourgeoisie*) without expense or formalities, in the towns where they shall become members of the trade-corporations."

The author of the memoir placed his supreme reliance upon this mode of encouraging labor; he sought to prevent crime by combating idleness. Private citizens had already announced their intention to found scholarships for the benefit of prisoners of this establishment; and, with a view to insure its success, the great Queen Empress had exhorted the bishops, the abbots, the spiritual corporations—in a word, all her subjects—to lend their aid in a project so excellent and useful.

In the fifth section M. Visschers treats of the administration of the prison, its discipline, and the management of its industries. The administration was confided, under the general direction of the states of Flanders and the special protection of the Empress, to a college of governors, composed of three deputies of the assembly of the states, one jurist, two notables, and four merchants. The Viscount Vilain was made a member of the college. The police and discipline of the establishment, and the reception, lodging, and conduct of the prisoners, were directed by officers who had under their orders various agents, and were themselves subject to the instructions of the deputies of the province. The management of the industries was confided to a director of manufactures, who had under him a number of foremen, and was himself guided by the rules and resolutions of the college of governors. An accountant kept the books. A surgeon was attached to the house. A

chaplain had his residence in the establishment. The Viscount Vilain says in his memoir: "Religion is not neglected in the prison; it is even made one of the objects of attention, and is never lost sight of. The change of manner, the quietness and submission of the prisoners, and their exemplary observance of the duties of piety assure us of the impression which has been made on the minds of many by pious exhortations and the word of God."

No prisoner was received except upon previous notice, given at least forty-eight hours in advance, and on the production of an authentic copy of the sentence of the judge or of the decree of commutation of afflictive punishments to imprisonment. At first no convict was admitted who was not able to work and to learn a trade.

The viscount gives formulas for keeping the registers relating to the general state of the prisoners, the trades at which they worked, and the product of their labor. *A special register showed the amount belonging to each prisoner of his share of his earnings.* Instructions are set down for the management of the hospital and the care to be given to the sick. A regulation of the 20th March, 1773, decreed by the Empress, fixed everything relating to the maintenance of good order and discipline.

One of the articles of this decree deserves to be cited at length, as showing at once the progress of humanity and the impossibility of wholly escaping the influence of the ideas and usages of the times. Article 26 reads thus:

As regards the police of the prison, we reserve it for a separate regulation, but in the mean time we declare that the directors, who shall be placed over the police, will not be permitted to inflict upon any prisoner graver punishment than that of confinement for two days on bread and water; and in case the offense merit a more severe correction, they shall report it to the first meeting of the administrators, who, on their part, will be allowed to prescribe only correctional punishments, such as being tied for some hours to a post, to receive *some blows with a stick*, which shall not exceed twenty-five, or of being confined for a moderate time in a *ribbed prison*—that is, on a floor with sharp edges, (*dans une prison à côtes, sur un plancher à arêtes vives*)—or for a few days in an ordinary prison on bread and water.

Article 27 also contains a remarkable provision, and one which must have been very sensibly felt by the prisoners when the time for their liberation came:

Every prisoner who, by resolution of the administrators, shall have been confined in a *ribbed prison*, shall remain, for each time that he shall have been so punished, eight days in the prison beyond his term.

On this the Viscount Vilain pertinently inquires whether, conversely, justice does not also require that the prisoner who shall have strictly observed the rules and regulations be rewarded therefor; whether it is not just that he who has shown zeal and exactness in the fulfilment of his duties, who has labored to reform his manners, and has mastered a trade that will insure him an honest living, should not be sooner restored to liberty. If bad conduct prolongs, ought not good conduct to abridge his imprisonment? The viscount adds:

The hope of shortening his captivity would be of the greatest service to him; it would be a strong motive to industry and good order; it would tend to beget and cherish in him a love of work; and it would certainly be a means of improving the discipline.

Vilain held and proclaimed the soundest opinions regarding the duration of imprisonments and the utter worthlessness of short detentions as an agent of reform. He says:

The administration will please observe that the term of six months is too short to reform criminals and train them to the love and practice of industry. These short-

term prisoners set a bad example to the others. They say that it is not worth the trouble of beginning an apprenticeship; and all their thought is directed to the termination of their imprisonment, that they may again return to a life of idleness.

These considerations lead him to the conclusion that the minimum of imprisonment should be fixed at a year. On the other side, he says:

A life-sentence reduces convicts to despair. Deprived of hope, they are indifferent alike to reformation and labor, and they turn their attention only to schemes of escape or revolt. Since we have not seen fit to deprive them of life, why should we seek to make it insupportable to them? Why not leave them the hope of re-entering society after expiating their crimes and rendering themselves worthy by assiduous labor and a genuine repentance?

The viscount, in his memoir, enters into the further inquiry whether, by the labor of the prisoners, the establishment may not be made self-supporting, and whether this same labor may not even be rendered a source of profit to the state without prejudice to free labor outside, and, in fine, whether the establishment of the house of correction sufficiently answers to the general desire of the public and to the end proposed, which is to dry up, or at least lessen, the sources of the evil, viz, idleness and vagrancy, so hurtful to the repose of society. He insists, above all, on the necessity of establishing in the house of correction manufactures and trades, which will assure to the prisoners on their liberation the means of an honest livelihood by their own labor. The aim is declared to be to impart a love of work, and to form them to habits of industry.

Finally, he proposes an establishment or school, under the name of hospital—a hospital for moral rather than bodily diseases—where the children of the poor will be reared and maintained in labor and good manners. The state, he says, is too much interested, has too deep a stake, in the extirpation of mendicity, not to make trial of this supreme agency to that end.

In his sixth section M. Visschers has collected divers honorable testimonies from various countries attesting the merit of the work so happily accomplished by the Viscount Vilain. The first and most important is that of the great English philanthropist Howard. He visited the prison in 1775-'76, and found there two hundred and fifty criminals—one hundred and ninety-one men and one hundred and fifty-nine women. Being present at the dinner of the male prisoners, he admired the regularity, decency, and order with which everything was done at the word of the director; not the least noise or wrangling was heard. He remarks:

This assemblage of one hundred and ninety criminals, robust and turbulent, seems to be governed with greater facility and less confusion than would be an assemblage of wise and educated men in civil society.

Eight small chambers or dungeons existed at that time for the punishment of refractory prisoners; but Howard found them always empty. He visited Ghent again in 1778. "I then saw," he wrote, "that the establishment was managed like a well-regulated manufactory. The prison population consisted of two hundred and eighty men and one hundred and seventy women. These last were engaged in making the clothing necessary for the house. Most of them, ranged in order, were spinning, knitting, or weaving, all attentive to their work and perfectly quiet. There was given to all, both men and women, one-fifth of their earnings. The specimens of cloth made there proved how much those are mistaken who think that no manufacture can be useful or prosperous which is carried on by hands imprisoned and forced to labor."

In 1781 he found the same care, the same discipline, the same dili-

gence, and the same progressive amelioration of the prisoners. There were two hundred and six male criminals, one hundred and six male delinquents, (including sturdy beggars,) and one hundred and fifty women, all occupied in divers manufactures or in the service of the establishment. The bread, soup, and meat were of good quality and in abundance. Everything announced the care and vigilant attention of the director.

I cannot but pause here for a moment to gather up and present to the admiration of all who read these pages the salient features of this remarkable experiment, conceived, inaugurated, and carried out to a complete success by Viscount Vilain, certainly one of the wisest and most gifted statesmen who have ever contributed by the light and warmth of their genius to the progress of humanity. Here we find, already discovered and applied a century ago, nearly all the great principles which the world even to-day is but slowly and painfully seeking to introduce into prison management. What are they? Reformation, as the supreme end to be kept in view; hope, as the great regenerative force in prisons; industrial labor, as another of the vital forces to be employed to the same end; religious and scholastic education and training, as a third force belonging to the same category; abbreviation of sentence and participation in earnings as incentives to be held out to prisoners to diligence, good conduct, and effort at self-improvement; the enlistment of the will of the criminal in the work of his own moral regeneration—his new birth to a respect for the laws; the introduction of variety of trades into prisons, and the thorough mastery by every prisoner of some one handicraft, as supplying the means of honest support after discharge; the use of the law of love and kindness as an agent of prison discipline, to the exclusion, as far as possible, of the grosser forms of force, which act upon the will mainly through the body; the utter worthlessness of short imprisonments, and the absolute necessity of longer terms, even for minor offenses, as the sole condition of the application to such offenders of reformatory processes; and the care, education, and industrial training of the children of the poor, and of other children addicted to vagrant habits, or otherwise in peril of falling into crime; an anticipation, in essential features and aims, of the industrial school and juvenile reformatory of the present day.

Howard revisited Ghent in 1783, but the prison was no longer what it had been. The Emperor, Joseph II, had yielded to the hostile representations of interested persons, who claimed that the prison labor offered an unjust competition with free labor outside, and had abolished the system of labor introduced by the Viscount Vilain and practised with such excellent effect. In consequence of this action of the Emperor, the manufacture, so useful and flourishing, had been destroyed, the trades abandoned, the tools sold, and the noble views of the founders of the house were, for the time, utterly thwarted and overthrown. But under the fostering care of the late able inspector-general of prisons in Belgium, Edward Ducpetiaux, the prison of Ghent regained in great part its former character.

In his seventh section M. Visschers traces briefly the progress of prison discipline during the last century, and gives an interesting *résumé* of the prison systems of different countries at the present time. As the result of this review, he thus expresses, in the closing sentences of his essay, his preference for what has become widely known as the Crofton prison system:

Progressive classification, with gradual amelioration of the prisoner's condition and augmentation of the pecuniary profits derived from his labor, has led to the discovery

of a new and fruitful principle, *emulation*. On one side, the convict dreads the consequences of every fault against discipline which would degrade him to a lower class; and, on the other, he sees the means of gradually improving his lot and hastening, perchance, the moment of his liberation. In the class to which he belongs, he has seen such and such comrades in toil, who, in recompense for their good conduct and diligence, have been promoted to a higher class. He says to himself that it depends upon his own will, upon the steadfastness of his efforts, to arrive at the same result.

Another consideration: We have observed how much deeper is the impression made by the divine word upon the heart and mind of prisoners when they are associated in worship. The same advantage is found in associated scholastic instruction.

But how great the difference for the convict, who must one day re-enter society, to have acquired the knowledge of a trade and to have labored under the ordinary conditions of life! It is a labor spirited, active, sustained; while, in the cell, after a sojourn too protracted, the convict knows only sadness, depression, and somnolence, and loses all energy, moral and physical. If, on his return to society, he must encounter the rough competitions of labor, if life itself has its asperities, will he be better prepared for these by a long sequestration? Shall freedom be given back to him without any tests to show whether he is able to bear it, or worthy to obtain it? Ought not society to exact guarantees sufficient, I will not say of his repentance, but of his good conduct, and his ability to henceforth lead an honest life?

It is in view of the happy results promised by the system inaugurated in Ireland by Sir Walter Crofton, and now introduced, with modifications, into the convict-prisons of England, that I give it all my sympathies, considering the ideas which belong to it to be as wise as they are well conceived.

The congress which is about to assemble will listen to the exposition and defense of all the systems. From its discussions there will flash a living light, which will penetrate two hemispheres, and contribute, no doubt, to elucidate questions which too long await a solution. I have desired to recall the point of departure, the attempts made, a century ago, toward the reform of prisons and the regeneration of criminals. The measures taken by the states of Flanders in 1771, under the inspiration of the Viscount Vilain, for the construction of the house of correction of Ghent, were marked by a wisdom which cannot be misunderstood—those measures which have borne fruits, whose excellence was recognized even by contemporaries. The men who have been benefactors of their age and their country belong to all nations in virtue of the ties of a common interest which unite all the members of the great human family. Is not the approaching reunion of the congress about to give the most illustrious example of this truth?

Let us place side by side these two memorable dates of 1772 and 1872, which will recall to our successors the erection of the first Penitentiary and the meeting of the great International Penitentiary Congress!

NOTE.

A paper of masterly ability and profound philosophical analysis was sent to the congress by Dr. Prosper Despine, of France, on the criminal himself, of which only a short and imperfect abstract was printed in the Transactions. The undersigned thought this essay of such exceptional value, because of its great originality and freshness, and still more on account of the just and practical views embodied in it and the scientific basis on which it seeks to build all prison management, that he translated and read it in the National Prison Reform Congress of Baltimore, held since the International Congress of London. As it will appear in full in the proceedings of the Baltimore meeting, no further notice of it need be given here.

PART FOURTH.

RESULTS OF THE COMMISSIONER'S PERSONAL OBSERVATIONS AND INQUIRIES RELATING TO THE PRISONS AND REFORMATORIES OF EUROPE.

INTRODUCTORY.

Both on his visit to Europe in 1871, to organize the Congress of London, and on that in 1872, to take part in it, the undersigned acted in a double capacity, being at once commissioner of the National Government and of the National Prison Association of the United States, and, on his second visit, being still further honored with a commission from the president of Mexico to represent the government of that country in the congress. He received, on the eve of his first sailing, the following letter of instructions from the Hon. Horatio Seymour, President of the National Prison Association, to wit :

UNITED STATES OF AMERICA,
New York, July 6, 1871.

SIR: As you have been designated by the National Prison Association of the United States of America as their commissioner and agent to arrange the preliminaries of an international congress on penitentiary and reformatory discipline, which is proposed to be held in Europe in 1872, it becomes my duty as president of the association to convey to you the wishes of the body touching the extent and scope of the work required of you, as well as the manner in which you are to discharge the duties of your mission. You are to proceed, then, to Europe at the earliest practicable moment, in fulfilment of the trust with which you have been charged.

If reforms in prison management are ever to be inaugurated, resort must sooner or later be had to governments, as legislation is the only means through which they can be effected. It has therefore been thought desirable that their co-operation in this work should be enlisted in advance. Hence, one of your chief duties will be to visit the several governments of Europe, to endeavor to awaken their interest in this proposition, and to induce them if possible to take part in the proposed congress by duly-commissioned representatives.

It is probable that the initiative of the United States in this project, and the official participation therein by the General Government, will smooth your path in approaching foreign governments, and materially aid the success of your mission. You will not fail to bring this point to their attention, and to press it upon their consideration as you have opportunity.

Another duty required at your hands will be that of visiting, inspecting, and examining as many of the penal and reformatory institutions of the several countries to which your mission shall extend as you conveniently can, in all cases carefully recording the results of your observations. You will also inquire into the prison systems of the different states of Europe, including the principles on which they are organized, their modes of administration and discipline, and the results accomplished through their agency. You will seek to secure the attendance at the congress of representatives from all the more important prisons and reformatories in each country.

A further object to be kept in view by you will be that of conferring with boards of prison managers, prison discipline associations, and other organizations having in view, wholly or in part, the promotion of reforms in this department of social science, and of procuring representatives to be sent by them to take part in the deliberations of the congress.

Another of your duties will be that of organizing, wherever you can, national committees, who will take charge of the whole business of making the requisite preparations for the congress in the several countries for which they may be appointed, and who will also prepare (to be read at the congress) brief memoranda setting forth the present state of the prison question in their respective nationalities.

As far as England and France are concerned, their national committees should be charged with the duty (if, as it is hoped, they are willing to assume it) of corresponding with the proper colonial authorities of their respective countries, and of securing representation from every colony subject to their authority.

An additional duty expected of you will be that of conferring with prominent persons abroad in regard, first, to the proper questions to come before the congress for its consideration, and, secondly, the proper persons to be invited to prepare papers upon the topics deemed most fit and necessary to be considered by the body. The object here will be to prepare the way for and facilitate the formation of such a programme of proceedings as may be judged best adapted to the ends in view in the calling of such a congress as the one proposed.

On the subjects above referred to, and such others as your own familiarity with questions and interests of this nature may suggest, you will make the broadest inquiries and gather the largest amount of information practicable, and will report fully thereon to the association on your return.

HORATIO SEYMOUR,
President of the Association.

E. C. WINES, D. D., LL. D.,
Corresponding Secretary and Commissioner of the National Prison Association.

All the points in the foregoing letter of instructions are covered in previous parts of the present report, except that which makes it the duty of the undersigned to visit, inspect, and examine, as far as circumstances would permit, the penal and reformatory institutions of Europe. To this work he was prompted as well by his own inclination as by the instructions of the president of the association. In obedience, then, to the dictates at once of choice and of duty, I personally examined, more or less closely, during my visits to Europe in 1871 and 1872, from fifty to sixty of the institutions referred to in the above-cited letter. Of these I propose to give, not a detailed description, for that would require both time and space not at my command, but some passing notice, in the chapters of this fourth part of my report.

CHAPTER XXX.

PERSONAL INSPECTION OF PRISONS AND REFORMATORIES IN IRELAND.

§ 1. *Convict prisons of Ireland.*—The penitentiary system, devised and carried into effect by Sir Walter Crofton in the convict-prisons of Ireland, has been so fully described in previous parts of this report, and has become in other ways so widely known, that I do not feel called upon to go into any detail upon the subject, and shall but briefly describe what I personally saw and heard during my visit to this now far-famed convict institution.

Penal servitude in Ireland, sentence to which is never less than five years, is undergone in three different stages and at three separate and distinct establishments. The first of these establishments is at Mountjoy, a suburb of Dublin, and consists of two prisons—male and female; the second is a public-works prison, on Spike Island, opposite Queenstown, at the southern extremity of Ireland, and more than a hundred miles distant from Dublin; the third is at Lusk, twelve miles from Dublin, and is what is called an intermediate prison. I spent a day at each of these establishments, accompanied throughout by one or the other of the two gentlemen composing the board of directors, viz, Mr. Murray or Captain Barlow—by the latter, however, everywhere, except at the male prison of Mountjoy. Every desirable attention was shown

me, and every possible facility afforded for the most thorough examination of every department of the convict service. I was permitted everywhere to converse freely with the convicts to any extent I desired, and that without the presence of the director who accompanied me, or any officer of the establishment; and I invited the confidence of the prisoners by the assurance that whatever they communicated would be regarded as strictly confidential, and should not, in any event, be reported to the authorities of the prison. Had I chosen to continue my investigations long enough I might, in this manner, have conversed with every inmate of every prison in the Irish convict establishment. As it was, I improved my opportunity to the utmost that my time would permit in conversing with a greater or less number of convicts in each of the three stages into which their imprisonment is divided. For a decade of years I had been a diligent student of the system, devouring everything I could get hold of on the subject. As far as books could teach it, it is scarcely an exaggeration to say that I knew it by heart. And I had done what I could to make it known to my countrymen. In my annual reports as secretary of the Prison Association of New York, in numerous short articles written for the daily and weekly press, in more extended essays published in the monthly and quarterly journals, in an exhaustive paper read before the American Social Science Association, in addresses made at public meetings in various parts of the country, and in private conversations without number, I had opened, explained, and commended this system in the clearest and strongest terms I could command. I had echoed and re-echoed the opinion of Italy's greatest statesman, the late Count Cavour, that the fundamental principle of this system—progressive classification based on merit, a progressive withdrawal of restraint and enlargement of privilege, as they should be earned and warranted by the prisoner's conduct, a gradual and almost imperceptible melting of prison life into the freedom of ordinary society through a probationary stage of natural training—that this principle, applied in some form, whatever the system adopted may be, is "the only efficacious means of discountenancing vice and checking crime, by encouraging, through agencies purely philanthropic, the reform of the criminal, without, however, holding from him his just punishment." And now I solemnly declare that the impressions received from published descriptions of the system have been, in the main, (I will not say without some modifications and abatements,) confirmed by personal inspection and study.

In the two prisons at Mountjoy—first stage—I saw the prisoners confined in separate cells, where they were kept on coarse and low diet, and employed at rough and uninteresting labor—oakum-picking and the like. This is the penal stage, and is intended, among other ends to be answered by it, to make the prisoner feel that the way of the transgressor is hard. Its maximum duration is nine months, which may by good conduct be shortened to eight. But hope is even here early planted in the prisoner's breast. The utmost pains is taken to explain to the convict, in the fullest and clearest manner, the entire course of his imprisonment, and all the advantages that will accrue to him, as he advances from stage to stage and class to class, from good conduct, industry, diligence in study, and attention to his moral improvement. Not only are these things set before each prisoner in his cell, but once a week there is held a kind of catechetical exercise on the subject, in which the convicts are questioned as to the completeness and accuracy of their knowledge in regard to it. According to the answers given, all errors are corrected and all deficiencies supplied. The effect, even in this penal stage, I

found to be hope, courage, cheerfulness, and a patient waiting for promised ameliorations. Indeed, these ameliorations begin during the period of cellular separation, and early in it. At first the seclusion is absolute. After a while, the cell-door is thrown open a part of the day, then all day. This slight approach to society is felt to be a great alleviation, and is withdrawn for any misconduct. From the first, the prisoners in this stage are together in chapel, school-room, and exercise-yard. Much attention is given to education and to moral and religious culture, wherein the "profiting" of the prisoners "appeareth unto all men," who have opportunity of observing it.

The day passed at Spike Island, where the second stage of imprisonment under the Crofton system is passed, was one of great interest to me. This may be properly designated as the reformatory stage, for it is here that the principle of progressive classification is applied and exerts all its force, having no existence in either the first or third stage. There are four classes here, arranged in this order: third, second, first, and advanced or exemplary. Promotion is determined by marks, of which the convict can earn a maximum of nine per month, viz, three for general good conduct, three for industry, and three for school duties—not actual progress, but attention to lessons and the desire shown to improve. On his transfer from Mountjoy to Spike Island, the convict is placed in the third class; 18 marks must be earned in order to his promotion from the third to the second class; 54 for promotion from the second to the first; and 108 for promotion from the first to the advanced or exemplary class. Thus the minimum time in the third class is two months; in the second, six; and in the first, twelve. The time necessary to be passed in the advanced class before removal to Lusk is not a fixed period, but depends upon the length of the prisoner's sentence. With a five years' sentence, he must remain in this class fourteen months; with a fifteen years' sentence, he must remain five years and eight months; and with a sentence between these two extremes, a period varying with its length. I was surprised to learn that a majority of the convicts earn the maximum of marks, and of course secure their promotion from class to class, and finally their transfer to Lusk, within the minimum period. But hope has a quasi omnipotence.

On the day of my visit to Spike Island, the number of prisoners was 705, distributed as follows: advanced class, 320; first class, 200; second class, 101; third class, 84. The motive to strive for promotion is not only powerful, but it is constant, and constantly increasing in strength. The progress toward liberation is the great motive-power; but there are manifold inducements to exertion, self-denial, self-conquest, and self-control besides this. With every advance, there is a lifting of restraint, an enlargement of privilege, an increase of gratuity, distinctive badges, better food, improved dress, greater liberty of action. The great effort is to induce the prisoner to become the chief agent in his own reformation. The authorities seem to feel that unless this is done, nothing is done. The result, as I learned it from the lips of many prisoners with whom I conversed—all separate and apart from their officers—is that the entire prison population, with few exceptions, are putting forth constant and vigorous effort to secure their promotion within the minimum time; that Lusk is ever in their thought and on their tongue; and that the hope of attaining that coveted goal, and a respectable position as honest laborers beyond it, keeps up heart in them, and produces alacrity at work and a constant flow of good spirits.

The men are nearly all employed on public works—quarrying and dressing stone and building docks. Their work is consequently in the

open air, and a busy set of fellows I found them. I never saw men either more industrious or more cheerful in their industry. They were doing quite as much as any free laborers outside would have done at the same kind of work, and a great deal more than the free laborers at that time employed on the island were doing. Still I would much rather have seen them at trades, with a free choice, among twenty or more, of which they would learn.

Mr. Hays, the active and able governor, allows any and all prisoners to come to him in his office at 6.30 a. m., with their burdens and grievances. From twelve to eighteen visit him in this way every day, and he allays their agitations and composes their difficulties. The effect, he informed me, is excellent. At 7 he holds a kind of court, at which the warders bring in their reports against any prisoners who may have been guilty, or who are by them regarded as having been guilty, of violating the prison rules. Of this class of cases he has some four or five every morning. He keeps a record of them in a book with the following headings: 1. Registered number of prisoner. 2. Name. 3. Date of report. 4. Nature of charge. 5. By whom reported. 6. Summary of evidence. 7. Explanation offered by prisoner. 8. Decision of governor. 9. Date of decision.

The punishments here are chiefly of a moral kind: loss of marks, forfeiture of gratuities, withdrawal of privileges, change of badge, degradation to a lower class, remanding to the cellular prison at Mountjoy, to which may be added (as punishments occasionally employed) deprivation of a meal, close confinement on bread and water, and even, in aggravated cases, the lash, which, I trust, will soon be banished in *sæcula sæculorum*.

The day I passed at Lusk was a day of mingled wonder and delight. This is the intermediate prison, so called because it holds a middle ground between an imprisonment strictly penal and the enjoyment of full liberty. The aim of the intermediate prison is twofold: first, to test the reality of the convict's reformation, his power of self-government, his ability to withstand temptation; and, secondly, to train him for a considerable period—never less than six months—under natural conditions, and so to prepare him for full freedom on discharge by the enjoyment of partial freedom as a preliminary step. Accordingly, the imprisonment here is little more than moral.

I had known this part of the Irish convict-system, as I had the others, from books. My expectations regarding it were high, but they were more than met. Indeed, I have never elsewhere seen anything to compare with the results shown here. The intermediate prison which formerly existed at Smithfield, in the outskirts of Dublin, has been given up, and all intermediate prisoners are now sent to Lusk. The number, on the day of my visit, was fifty-seven; the usual number is a little in excess of that figure.

Farm-work is the only industry from which income is received, and the cash revenue from this source, over and above the value of the products used in the establishment, amounts (at least such is my understanding of the matter) to about \$10,000, which makes the institution well-nigh self-supporting. The farm contains nearly 200 acres. Prior to the establishment of the prison, this land was a common, wild and uncultivated. The whole of it has now been subdued, and brought under successful and profitable tillage. The value of the land has increased under the labor of the prisoners, from 10s. to £5 per acre. There is a large annual hay-crop gathered; wheat, oats, and barley are grown in considerable quantities, but the principal products

are potatoes, cabbages, turnips, celery, and other vegetables. It was the 14th of October when I was there, and the prisoners were at work on various parts of the farm, digging esculents, hauling and spreading lime, and performing other kinds of farm-labor; and a half dozen or more were engaged in the construction of a stone dwelling for the superintendent, in place of the iron hut which at that time served him for a residence. Everywhere they were as busy as bees, and, to all appearance, as happy. I never saw a brisker or more cheerful set of laborers. They accomplish fully as much work as an equal number of free hands. Indeed, the farmers of the neighborhood aver that they would be glad to get men who would work as well. For the most part they work in groups, and have a warder to oversee them, who is, however, at the same time, a fellow-laborer with them. But this is not always the case. Often they work alone, or in companies of two or three, without any one in charge, on the most distant parts of the farm. As far as appears to the view, there is no more imprisonment here than on any other farm. There are no walls, no bars, no bolts, no gratings, no apparent confinement of any kind. The doors of the iron tents which serve them as dormitories are locked at night, just as our own houses are when we retire. The only difference, as far as I could see, between this and any other large farm employing a great many hands, was that here a warder slept in a small room at the end of the large dormitory of the convicts.

In the afternoon I walked about the farm, mingled freely with the convict laborers, and talked with quite a number of them entirely apart from the officers. Their uniform testimony, the truth of which was attested by their whole tone and bearing, was to this effect: That the hope held out to them of constantly bettering their condition by their own exertions was, throughout the whole course of their imprisonment, a powerful stimulus to good conduct, industry, and exactness in the discharge of all their duties; that the intermediate prison was the goal toward which they had been constantly aiming, the object of incessant desire and effort; that at Lusk they never heard any plotting of future crimes; that, on the contrary, all the talk of the men in that prison, when the time of their liberation was drawing nigh, was as to where they would go, what they would do, what wages they might be able to obtain, and how they could win honest bread and an honorable position; that a profane or obscene expression was scarcely ever heard there; and that if such a thing chanced to occur, as it sometimes did, it was instantly frowned down and put a stop to by the prisoners themselves. Yet there is no restraint upon conversation at Lusk more than there is among the laborers on any large farm or other well-regulated industrial establishment. Lusk has now been nearly twenty years open for the reception and treatment of intermediate prisoners, with opportunities of evasion, such as no other prison in the world offers, and yet scarcely have a dozen attempts at escape been made. The whole vicinage was in terror at the announcement that a prison without walls or bolts was to be established on Lusk Common; yet only one complaint, in all these years, has been made against the prisoners who have found a home there. That happened on this wise: There is no chapel on Lusk farm, and the prisoners attend the parish church on Sunday in a body. On one occasion a prisoner, in leaving the church at the close of the service, addressed a passing remark to a young woman at his side. There was no pretense that the word spoken was in itself an improper word. The complaint was that he spoke to her. There is no *discipline* at Lusk; no punishments are administered there any more than on a farm or in a manufacturing establishment where free laborers are employed. The prisoner was,

therefore, sent back to Mountjoy, from which, after a month's "separate and solitary confinement," he was restored to his place on the prison-farm, and neither before nor since has complaint been made by any human being against the inmates of the intermediate establishment, a fact, to my mind, truly marvelous.

During my visit, the entire prison population was called in from their work to allow me to see them in their school, and especially to witness one of those competitive examinations, conducted by the prisoners themselves, which became so marked a feature of the intermediate prisons under the late Mr. Organ. As the men came in, there was nobody in the room but myself, not a single officer being present; yet so quietly did each prisoner enter, go to his own desk or table, take out his book and commence his studies, that, if my eyes had been closed, I should scarcely have supposed that a half dozen persons were in the room; certainly I could not have dreamed that nearly sixty men had entered. Not a word was spoken; not a disorderly or even playful act was done; nor was there the least confusion or noise of any sort. The men were arrayed in two long rows on either side of the room, and, under the superintendence of the school-master, the two sides put questions alternately to each other. The exercise was an interesting one, but less so than I had anticipated. It had somewhat the appearance of being, as we say, "cut and dried." Mr. Organ is dead, and his successor, in the lecture department, has not yet been found. Speaking of Mr. Organ, who, for a dozen years or more, held the double office of superintendent of discharged convicts and lecturer to the intermediate prisons of Lusk and Smithfield, I cannot close my brief account of the visit made in 1871 to the convict-prisons of Ireland without citing a few sentences from one of the last reports, if not indeed the very last, made by him before his lamented death. He says:

Crime is fast disappearing in Dublin. Old and habitual thieves are becoming honest and industrious citizens, while homes, which have hitherto been the scenes of vice and poverty, are now replaced by those of morality and plenty.

• Employers continue to repose confidence in my men, and the demand for them has at times exceeded the supply.

The moral tone of the institution is most satisfactory. There is an entire absence of even the slightest tendency to immorality, whether in word or act; and should hypocrisy show itself in a new-comer, it is promptly detected, and as promptly censured by the public opinion of the men in the huts.*

I cannot speak too highly of the charming effects which farm-labor has produced, even upon the most sluggish criminals, nor of its happy results on even the cool and calculating adept in crime, on whose brow the honest drop of sweat had never before trickled.

I am ready to stake my reputation on the fact, proved in innumerable instances, that the most indolent criminal can be trained to honest and independent toil, not so much through fear or coercion, as through the influence of hope and encouragement.

Truly Lusk is a magnificent triumph of reason and humanity over coercion and brute force—a splendid and irrefragable testimony to the soundness of the penitentiary system which the genius of Sir Walter Crofton has given to the world.

§ 2. *Juvenile reformatories of Ireland.*—Ireland is now well supplied with this class of institutions, both Catholic and Protestant. Only one of them, however, was visited by me; and to that I shall confine my remarks, which, for the rest, will be very brief. I was accompanied by Mr. John Lentaigue, the intelligent and amiable inspector of reformatories for Ireland, and two other gentlemen, friends of his. The institution visited is the St. Kevin's reformatory, for the treatment of delinquent Catholic boys exclusively, and is the largest of the kind in

*Mr. Organ refers here to the two iron tents at Lusk, erected at a cost of only \$3,000 each of which is, nevertheless, capable of accommodating fifty convicts.

Ireland, having an average of more than three hundred inmates. It is distant ten miles from Dublin, the road ascending nearly all the way, and at a pretty steep grade, as the reformatory is 1,800 feet above the level of the sea. It is situated at the head of a romantic and picturesque glen, called Glencree, or the Valley of the Heart. The name is most appropriate, as being significant of the spirit of love and kindness in which such institutions should be conducted. But, for all that, the place has not, in my judgment, been well chosen. The soil is of the worst possible description, the greater part of the one hundred acres rented for the use of the establishment being utterly irreclaimable and worthless; and even on the forty or fifty acres that have been brought under tillage by the labor of the boys, little will grow except grass. The cold in winter is often intense and the storms terrific. It is but a few years ago that a juvenile convict, on his way to the reformatory, was frozen to death before reaching it. All supplies for the institution have to be hauled on carts or wagons ten miles up a mountain, and all manufactured articles, seeking a market, the same distance down it. Yet, despite all these disadvantages and drawbacks, the Glencree reformatory is doing good work. Father Fox, born and reared in the Quaker faith, (and none the worse for that,) is at the head of it; and he impressed me as being—if I may be allowed a hackneyed but expressive phrase—pre-eminently “the right man in the right place.” At all events, he and his indefatigable corps of assistants have shown themselves greatly successful as regards the main purpose of their work. If the acres on which the boys are placed have proved, in large measure, irreclaimable, the case of the boys themselves has been quite different. Ninety per cent. of these are reformed, and, on their liberation, become a constituent part of the industrious and honest yeomanry of the country. That tells the whole story more eloquently than I could; and all further words may be spared.

CHAPTER XXXI.

PERSONAL INSPECTION OF PRISONS AND REFORMATORIES IN ENGLAND.

§ 1. *English prisons.*—In the course of my two visits to England I had opportunity to examine more or less thoroughly four convict-prisons and some ten or twelve county and borough jails. Compelled to study, in what remains of my report, a rigid economy of both time and space, I can give to these establishments only the most cursory notice—far less, indeed, than either their merits demand, or my own feelings would prompt. There is much in the English prisons and the English penitentiary system to be admired, commended, and imitated; but there are, also, as I conceive, things in them to be criticized and avoided; things, too, which belong to the very core and essence of a just and especially a reformatory prison discipline.

The prison buildings in England, as a rule, are substantial structures of stone or brick, on the radiating plan, well proportioned and pleasing to the eye, with a lofty tower attached, for purposes of ventilation; the grounds are handsomely laid out in parterres and gravelled walks, and many of them ornamented with flowers, vines, and shrubbery; halls, running through the center of each wing, are lighted from the top, and the light is so disposed as to produce a soft and cheerful effect; the cells are spacious, airy, and well lighted, each having a water-closet, gas-burner,

and bell-pull, with an iron card attached to it by a spring, which starts out from the wall on the ringing of the bell, and each is also provided with all needful furniture; the long galleries, tier above tier, impart a feeling of perfect adaptation to their special object, which is far from unpleasant; the chapels are generally of ample dimensions, of gothic architecture, with groined roofs, always neatly and sometimes beautifully arranged, and well suited to produce a solemn and soothing effect upon the prisoners; an extraordinary cleanliness reigns throughout—in cells, corridors, offices, everywhere—and one is particularly struck with the brightness of the brass-fittings and the polish of the metal stair-cases; the hospital accommodations are excellent, the wards being well arranged for the treatment of different classes of disease, and all the appointments adapted to the convenience, comfort, and cure of the patients; the ventilation, drainage, and all other sanitary arrangements are the best that science can supply; the discipline is exact, and is rigidly enforced; obedience is prompt, and order and decorum everywhere observed; and there is a certain charm in the symmetry, harmony, and clock-like regularity of the whole, which takes away, at least from the first view, the awe and horror anticipated by the inexperienced observer.

Such, in brief, and without any attempt to exhaust the attractions of the picture, is the bright side of the English prisons, whether convict, county, or borough. But, unhappily, there is a *per contra*. While the material efficiency of these prisons is certainly very high, the moral action seemed to me feeble. While the avowed end of all prison authorities—or nearly all—is “reformation,” it appeared to me doubtful whether they fully appreciated what that work demands. The whole aim and instinct are for material efficiency. Hence—so it seemed to my apprehension—the shell is preferred to the kernel; the forms are made of more account than the substance. Hence, too, reformatory discipline is, to far too great an extent, made secondary to punitive inflictions. Consequently the men chosen for officers—though, as a class, superior, I freely admit, to the same class among us—are often not of the sort required for the work to be done. They are too artificial, keep the prisoners too much at arm’s length, rely too exclusively on authority, have too little faith in the susceptibility of criminals to reformatory agencies, and hence work but feebly—and, as a consequence, with little effect—to that end. In a word, they are not such—at least the greater part are not—as can subdue, control, and change the prisoners by moral influence. Though the governors are generally men of ability, character, and culture, all are not such. Some are unfit for their posts. There should therefore be some means devised for testing the deserving among these and other officers; some mode adopted whereby rewards and preferments may be given to the meritorious, and the unfit and unworthy removed from their offices.

Too little account, speaking generally, (there are honorable exceptions,) is made in English prisons of industrial and skilled work; too much of wasted labor, in its many forms. Tread-mill, crank, shot-drill, stone-breaking, and costly usages of that sort prevail, and the reasons assigned for their use are apt to be given in such catch-words as these: “Ancient prestige,” “nothing to be learned from theorists,” “practical men,” “not presume to be wiser than our forefathers,” “productive work injurious to honest outsiders,” &c. I am sorry to differ from some most excellent English friends, (though, I am glad to add, supported by a host of others,) but I altogether disapprove of mere penal and unproductive industry as irritating and brutalizing to prisoners. The introduction of trades, as many as possible, coupled with

longer sentences in the country and borough prisons, seems to me at the present moment a great want in England. Special prisons might, perhaps, be usefully employed for special trades. I should think it most desirable to *multiply* trades, so as to insure, as far as possible, that every prisoner should learn a way of getting his bread according to his turn; and to this turn the aptitudes and tastes of individuals should be particularly studied. Some liberty of choice should be given in this matter, even to prisoners; it would be a great step toward the restoration of their manhood. An incidental advantage of the multiplication of trades would be that it would tend to stop the mouth of those who complain of the competition of prison labor with free labor, though really there is scarcely enough in that argument to merit a refutation of any kind. But for its practical effect on prisons and prisoners, it might be given to the winds.

Scholastic education in English prisons receives more or less attention; in the government or convict prisons, much care is given to it. But everywhere it needs a broader development, a higher activity.

Twenty years ago boys were mixed with men in the English prisons, and came out old knaves, skilled, theoretically, in all the devices of practised villainy. This is no longer so. But the principle of progressive classification, by which prisoners, on the ground of merit, are advanced from stage to stage, with constantly diminished restrictions and constantly enlarged privileges and comforts, is not widely applied in county and borough goals; nor, indeed, can it be, until the principle of cumulative sentences is incorporated in the penal code. In the convict establishments, known as public-works prisons, progressive classification exists; but promotion is earned by industry alone, all other qualities and efforts being thrown out of the account; a grave mistake, in my judgment; though in part repaired by a forfeiture of marks for misconduct.

Voluntary and unofficial visitation, for moral and reformatory ends, by competent and discreet persons, is not admitted in English prisons of any class. In this respect England has made progress backward in these later years. Even Latimer, in a sermon preached before Edward VI, lifted up his voice for this: "I would ye would resort to prisons," he exclaimed, "a commendable thing in a Christian realm. It is holy-day work to visit the prisoners." In Elizabeth's reign, Bernard Gilpin, not as chaplain, but as a volunteer worker, regularly visited all the jails that fell within the range of his missionary circuits in the northern counties. Very soon after the organization of the Christian Knowledge Society, in 1699, a "committee of prisons" was appointed, who visited, exhorted, and distributed religious books to the prisoners of Newgate, Marshalsea, and other London prisons, and sent packages of their books to all the county jails in the kingdom. The members of the "Godly Club," embracing the Wesleys, Whitefield, and their most zealous followers, visited unofficially, preached, prayed, and distributed books and alms in all the prisons within their circuits, and continued the practice till compelled by the authorities to desist from this part of their labors. At a later day, John Howard, Elizabeth Fry, Sarah Martin, and many other excellent men and women, less known to fame, but no less zealous or worthy, became volunteer visitors in prisons, to the abundant advantage of England and the world; insomuch that England, to-day, may be fitly exhorted, in the words of the Hebrew prophet, to "search for the old paths, and walk therein." I do not think that the clergy ought to be the only teachers of prisoners. Competent persons of both sexes should, under fit restrictions, be admitted, when they are willing, to share his work with them. Especially women—intelligent, discreet, and

sweetly-mannered women—should be encouraged to visit prisons and to bring their magnetic influence to bear on the improvement and reformation of the prisoners.

Another defect in the penitentiary administration of England: the will-power of the prisoners is not adequately developed and invigorated. Fifty years' experience of men, fifty years' work among men, have impressed upon my mind only one idea. It is that nothing can be done with them except through the will. The will can be reached only through the intelligence and the heart. For this, first, religion, in all its freedom, purity, and power, is necessary; and, secondly, in the case of prisoners, progressive classification, whereby the ordinary motives which control men in free society, and urge them to industry and virtue, may act steadily and effectively upon these also, determining to good the choices of their will, and so the actions of their life.

One further point in a way of criticism: I refer to the want of unity in the county and borough jail system. Every jail in England is independent of every other. The little discrimination exercised in the treatment of prisoners struck me as a great defect. There seems only one medicine for all the diseases. Even in the employment of the tread-mill, on which no prisoner can be placed except by express authorization of the medical officer of the prison, and where, therefore, uniformity might be looked for if anywhere, the usages are exceedingly different. In some jails the working hours on this machine are six and a half per day; in others, eight and three-quarters. In some the velocity per minute is thirty-six steps; in others, forty-eight. And the number of feet ascended daily varies from 7,800 to 21,000! In other departments of the administration the differences are no less. Now, I do not object to local government within reasonable limits; on the contrary, I favor it strongly, believing it essential to a living, energetic, effective administration. At the same time I hold, with equal strength of conviction, that the penal system of a country should be a unit; that there should be, in each, some central authority, having, within due bounds, (for in this, as in other departments of the public service, there may be an excess of centralization,) the oversight and control of all institutions, whether of a penal or reformatory character, looking to the prevention and repression of crime. On this condition alone, it seems to me, can there be secured that skillful adaptation to each other of the several parts of the system which is necessary to the harmonious and efficient action of the whole.

I do not propose a description of particular prisons, but will make a passing reference to one or two of them which offer favorable points. The Devenport prison, of which Mr. Edwards is governor, is one of these. It has an average of seventy prisoners. The labor is chiefly industrial. From cocoa-nut fiber, costing £2 sterling per ton, the prisoners manufacture textiles worth £45. The prisoners work in association; there is no separation, except at night. In four years there have been but two recommitments—a pretty strong proof that industrial labor is not inferior to penal labor in deterrent effect. There has not been an infirmity case in the last four years.

The Wakefield prison, West Riding, Yorkshire, is admirably organized and managed by its energetic governor, Captain Armytage. The encircling wall, which is of hewn stone, massive and lofty, incloses eighteen acres of ground, which are almost wholly covered with the numerous buildings belonging to the establishment. The average number of prisoners is about twelve hundred, of whom nearly one-sixth are women. The Wakefield jail is conspicuous among the prisons of Eng-

land for the zeal and success with which industrial labor is carried on in it. In this respect it is quite a counterpart to our American prisons, presenting in every part a scene of busy toil. I believe it is nearly, if not quite, self-sustaining, and I think it has no tread-mill; but my notes are silent on both points, and my recollection is not perfectly clear on either. The prison is built on the separate plan, which is carried out to a certain extent; but the exigencies of the labor system adopted have made great inroads upon that principle. In effect, the prison is conducted much more upon the Auburn than the Philadelphia system. Numerous trades are carried on here, being required to meet the wants of so vast an establishment; but the only industry which brings in a money revenue is the manufacture of mats and matting. Of these the amount produced is enormous. The chief market is the United States, particularly New York and San Francisco, the great carpet-house of the Messrs. Sloane, in the former of these cities, being purchasers to the extent of something like \$25,000 annually. The prison has a cash capital of \$100,000, all derived from the earnings of the prisoners.

§ 2. *Aid to discharged prisoners—the refuges at Wakefield.*—Liberated prisoners in England are helped in their efforts to reform mainly by aid societies; but two of the most interesting establishments in the world, instituted in this view, exist in connection with the Wakefield prison. One of these is a refuge for male prisoners discharged from the establishment, and the other a home, similar in design and character, for the females. The chance here afforded, through these refuges or homes, to every released prisoner, male or female, who desires to reform and eat honest bread, is beyond all praise. In the male refuge, at the time of my visit in 1871, there were accommodations for forty inmates, but they could, at any time, be readily enlarged so as to admit a considerable number more. The inmates are furnished with good board; clean and well-aired dormitories; a bed consisting of iron bedstead, a first-quality hair-mattress, three sheets, two pillow-cases, two dark blankets, one white coverlet, and a box serving at once as a trunk and a seat; a night-school every evening; a preaching service and Sunday-school on the Sabbath; a well-selected miscellaneous library; a reading-room, provided with daily and weekly journals, &c., all at an average rate of 7s. 2d. sterling per capita a week. They work at mat-making, and their average weekly earnings are from eleven to twelve shillings. They do piece-work at rates a little less than those usually paid, because the refuge is not designed to afford permanent employment, but merely to bridge over the chasm between the prison and steady remunerative labor. This chance is given to *every man* released from the Wakefield prison who desires it, and its benefits are fully explained to all during their incarceration, so that not a solitary person, discharged from that prison, can ever come back to it under the pretext that he could get no work to do. Is not that noble? Why may not all large penal establishments organize something of the same kind?

The home for discharged female prisoners is managed upon the same general principles, but the women are not able to earn a full support. The income from their work has to be supplemented by private benefactions. They are accommodated in a new and spacious mansion, built expressly for the purpose, admirably planned, and provided with all needful appointments.

§ 3. *Mrs. Meredith's Wash-house.*—Among the almost innumerable charities of London there is one of a very peculiar character, called the Prison Mission, which is as praiseworthy as it is original. It was devised seven or eight years ago by the lady whose name stands in the

caption of this section, and who is well known in England as one of the most energetic and efficient workers in behalf of discharged female prisoners in that country. The work of the mission is divided into four branches, of which two only will be noticed—and that all too briefly—in this report.

One of these aims is to assist and save prisoners discharged from the London House of Correction for Women. The ladies of the mission have hired two small rooms near the gate of the prison, where some of them are in attendance every morning at the hour when those who have served out their time are discharged, to capture (if that word is admissible in a good sense) as many of the women who have been set free as they can persuade to try a better way of life. They give them a hot cup of tea, with a piece of bread and cheese, read a portion of scripture and offer prayer on their behalf, and explain to them their benevolent intentions and the advantages to be gained from yielding to their persuasions. They succeed in their endeavors with a few of the multitude of wretched outcasts who daily emerge from those prison-walls. But what do they do with and for those whom they have won? They have established an immense laundry, where the clothing and bedding of the poorest and foulest dwellers in the crowded dens of London are washed by these liberated convicts at a cost considerably below what they could do it for themselves. Scores and hundreds of these poor creatures are lifted up and restored to the walks of honest industry through this unique and wonderful agency. The women come at 8 in the morning and leave at 7 in the evening, having an hour's intermission at mid-day. They bring their own dinners, but are provided with a free tea, and receive a shilling a day for their work. Every afternoon, at 4, they are assembled in the chapel, when a chapter is read and prayer offered; and every Sunday evening, at 7 o'clock, a special service is held, to which all are invited; the gospel is preached, and each is afforded, if she will accept, the refreshment of a cup of tea. What a noble charity! It gives work to those whom none are willing to employ. It pays wages to those who are forbidden by many barriers to seek their livelihood elsewhere. It affords them the opportunity, while earning bread, to earn also an honest fame, and to secure ultimately, which nearly all do, better work and higher pay. At the same time, it is a charity which has another aspect, scarcely less important or beneficent, in enabling the lowest class of the London poor to secure clean clothing and bedding at the cheapest possible rate—6d. per dozen pieces.

The other branch of the prison mission-work, to which reference will here be made, is of a preventive character. It aims to save the children of criminals from the paths trodden by their parents. The ladies have established a village of cottages, each cottage containing accommodations for ten children, who are placed under the care of an adoptive mother. This settlement is called "Princess Mary's Village," that lady, now the Duchess of Teck, having taken the work under her especial patronage. At present there are ten cottages clustering around a neat little church and school-house. The intention is to enlarge the village as rapidly as circumstances will permit, until the number of cottages reaches thirty, thus providing for three hundred children.

§ 4. *The Carlisle Memorial Refuge for Women.*—The assistance given to liberated male prisoners in England is almost wholly through aid societies. Not so, however, with female prisoners. Indeed, societies would not, for them, meet the necessities of the case. It is far more difficult for women than for men to obtain situations immediately on their release from prison. Consequently they need to have provided some

place in which their good resolutions may be tested, and some guarantee given for their continued good conduct, before families will be willing to receive them into permanent employment. Hence, those women who so elect, if their prison character has been such as to warrant the indulgence, are allowed to pass the six months immediately preceding the term of their release in refuges established and managed by private effort, but assisted by contributions from the government. Here they enjoy the advantages of a treatment approaching that of home influence, for those establishments are not prisons, either in appearance or discipline—they are *homes*. There are now three refuges for female convicts, the Carlisle Memorial Refuge, at Winchester; the Eagle House Refuge, at Hammersmith, for Roman Catholics, and the Westminster Memorial Refuge, lately established at Streatham. One hundred and seventeen women passed through these refuges in 1871 out of a total of two hundred and seventy-five who were discharged from sentences of penal servitude. The number availing themselves of the advantages they offer has heretofore been limited, for want of accommodation; but the establishment of the last-mentioned refuge at Streatham has prevented the possibility of their suffering this disadvantage again.

Of these, the only one which I visited in the summer of 1871 was the Carlisle Memorial Refuge, at Winchester, at that time under the general direction of Sir Walter Crofton. I was much pleased with the institution, which, from its reports and from what Sir Walter told me, has been very successful in saving from a return to crime the class for whom it is designed. The superintendent, Miss Pumfrey, seemed admirably fitted for her place. Lady Crofton, I found, took an active interest in the refuge, spending three hours there daily in keeping the books and conducting the correspondence. The number of inmates was about sixty, which, I think, is not far from the average. Much pains is taken to keep track of the women after they leave the refuge. Here is a specimen of the record kept of each:

———, discharged August 9, 1867. Same date, went as servant at 14 Queen square, London. February, 1869, left with a good character, and went as housemaid in Grove street, No. 104. January, 1870, went as housemaid in Birmingham. May 16, 1870, doing well in same place. July, 1870, in same place; wages raised; visited by Miss Pumfrey. November 25, 1870, doing well in same place. Same in January, 1871. Same in June and July, 1871, at which latter date she was receiving £18 a year.

The sentiments cherished toward the refuge by those who have enjoyed and appreciated its advantages are well expressed in a letter addressed to Miss Pumfrey by this same person, under date of June 6, 1871. The original now lies before me, and I take from it the following sentences:

DEAR MISS PUMFREY: * * * Will you please write to me soon? I do want to hear how you are, for I can never forget you, dear Miss Pumfrey, never. You did say, please, miss, you would give me one of your portraits. Will you please send me one, if you have one to spare, so that I may place it beside dear Mrs. Bradstock? How is that dear lady* and family? Hope they, with yourself, are well. May the Lord God Almighty ever bless you both for the many hearts you have saved and made happy from trouble. Dear Miss Pumfrey, how are all the women going on? I hope they do not give you much trouble. Please remember me to those that know me, and tell them I am still quite happy, and also tell them that the path of honesty, righteousness, and truth is the path that leads to happiness; and I pray that many, many more souls may be brought to Jesus—yea, that all may be brought to Jesus—as dear Mrs. Barton used to say, “one and all.” “Him that cometh unto me I will in no wise cast out.” Precious words! Onward, homeward, upward, heavenward. Good-bye. God bless you.

From your humble friend,

* Referring to Lady Crofton.

§ 5. *English reformatories.*—These have been, both in their principles and workings, so fully described in preceding parts of this report, that I do not think it necessary to enter into further detail upon the subject. A considerable number of them were visited in different parts of the kingdom, one or two of which I had intended to describe, particularly Miss Carpenter's Red Lodge Girls' Reformatory, at Bristol, a model institution in all respects, especially in its intermediate department; and the girls' reformatory, at Hampstead, London, under the care of Miss Nicoll, which, in neatness, thoroughness, order, and efficiency, moral and material, struck me as one of the best-organized and best-managed institutions of the kind I had ever met with on either side of the Atlantic. But I forbear.

CHAPTER XXXII.

PERSONAL INSPECTION OF PRISONS AND REFORMATORIES IN SWITZERLAND.

§ 1. *The prisons of Switzerland.*—I visited five penitentiaries in Switzerland, viz, at Geneva, Berne, Zurich, Lenzbourg, and Neufchâtel. The tendency of public opinion in this little republic is strongly in the direction of the Crofton prison system in its fundamental principle—that of progressive classification, with gradual withdrawal of restraint and enlargement of privilege, as these are earned by industry, good conduct, and manifest and successful effort on the part of the prisoner toward self-conquest and self-control. However, the first two of the penitentiaries named above—those at Geneva and Berne—are quite an exception to this rule. I shall attempt no description of them further than to say that they appeared to me deficient in most of the essential qualities of good prisons. Each of them may be pronounced a discredit to the city which provides no more suitable plan for the treatment of its criminals, to whatever extent they may have offended against the laws. If, as I hope, the next international prison reform congress shall be held in Switzerland, it will become these two ancient and renowned cities to bestir themselves in the erection and organization of prisons more worthy of themselves and their country, and more in harmony with the progressive spirit of the age in the matter of penitentiary discipline.

On the other hand, the penitentiaries of Zurich, Lenzbourg, and Neufchâtel which I visited, and, as I was informed, those of St. Gall, Bâle-ville, Tessin, and perhaps some others, are in a satisfactory condition. Into all of them, I think, has been introduced, in different degrees and with various modifications, the progressive Crofton penitentiary system.

The penitentiary at Zurich is under the care of Mr. Wegmann as director, who is a most excellent person, with advanced ideas, thoroughly devoted to his work, and intent on improving the mental and moral state of his prisoners. The prison building is an old Dominican convent, of large dimensions, built in the middle ages, massive and strong. It has been altered and accommodated to its present uses. Naturally it is irregular in structure and arrangements; but it is well kept, clean and pure in every part. The average number of inmates falls but little short of 250; at the time of my visit there were 210. It is organized and conducted on the progressive plan. There are three classes. In the lowest class, there were 60 the day I was there; in the second, 128; and in the third, or highest, 12. Prisoners in the lowest class are in cellular confinement night and day; those in the other two are in separation only at night. The minimum of cellular imprisonment is three

months; the maximum, six months. Privileges are increased as they are earned. Ten to fifteen trades are carried on here. Prisoners who were artisans prior to their commitment work, when possible, at the trades which they had previously practised. Prisoners ignorant of a trade when committed are allowed to choose from among those practised in the prison the one they prefer. The prison has a chaplain, who devotes his whole time to the duties of his office. This officer had died the week before my visit, and no successor had been appointed. The late incumbent acted as schoolmaster as well as chaplain; but hereafter this office will be separated from the chaplaincy; and the schoolmaster, like the chaplain, will give his whole strength to his own work, that of secular or scholastic instruction.

The canton of Zurich has a new criminal code, of rare simplicity and excellence, the work, largely, of the distinguished Professor D'Orelli, in whose society and that of a few other cultivated gentlemen I had the honor to pass an evening, greatly to my profit as well as delight.

The penitentiary of Lenzbourg, in the canton of Argovie, has been built within the last few years. It is admirably arranged in all respects, and provided with every convenience and facility for the effective treatment of criminal men and women. Both its construction and organization are due to the zeal and energy of the late president of the confederation, Mr. Welti, a gentleman of marked ability, wisdom, and philanthropy, whom I found at the executive office in the national capitol, and ready to receive visitors at 8 o'clock in the morning, earlier, I think, than any other ruler in the world. The director of the penitentiary is Mr. Victor Hürlin, whose installation had but recently taken place. We were, therefore, shown through the establishment by the sub-director, who has been many years in office, and who impressed me as a man of great intelligence and efficiency. The prison I found, throughout, in excellent condition, and altogether an admirable institution. On the day of my visit, there were two hundred and three prisoners, of whom thirty-three were women. It is managed on the Crofton system, with the inmates divided into three classes. The duration of cellular imprisonment here is quite elastic. It has a maximum, but no minimum limit. The maximum is a year, but within that period the director can transfer a prisoner from the separate to the associated stage whenever he judges it expedient. Unlike Zurich, the number of prisoners in each of the three classes in the Lenzbourg penitentiary was nearly the same. The number of trades practised is twelve to fifteen, and the convict has the choice of which he will learn.

At the penitentiary of Neuchâtel I passed several days as the guest of its director, Dr. Guillaume. I had opportunity to study it thoroughly, and I feel no hesitation in placing it among the model prisons of the world. Dr. Guillaume is a gentleman of great versatility of talent, high culture, boundless enthusiasm, and rare aptitudes for his calling. He has but one idea, one aim; and to that he bends all his strength with a sleepless and tireless devotion: it is to change the bad men committed to his care into good ones; to receive criminals, and return them to society honest men. The average number of prisoners is about eighty, all men. There are three kinds of sentence. Some of the inmates are sentenced to *simple imprisonment*, (these are called correctionals;) some to *réclusion*, (no English equivalent in the sense here used,) and some to *travaux forcés*, (hard labor.)* Those under

* By the introduction of this statement here it is not meant to be implied that these sentences are peculiar to Neuchâtel. The distinction is one in use in most of the countries of continental Europe.

the first-named sentence are misdemeanants; those under the other two, felons. Nevertheless, in prison they all have much the same treatment. The number sentenced correctionally, as compared with those sentenced to *réclusion* and hard labor, is nearly as seven to one; but the number of correctionals actually in prison at any one time is but little more than half of the whole number of inmates. The reason is the comparative shortness of their sentences. These vary from a month to two years, but the average is only four months.

The penitentiary treatment here has for its aim, as already stated, the moral reformation of the prisoner. This treatment is progressive, and the classification is similar in principle to that of the Crofton system. On their entrance the prisoners are placed in the lower or penal class. In this class cellular separation, day and night, is rigidly enforced. The prisoners are placed in cells bare of all ornament and having few articles of furniture, simply such as a due regard to health requires. In this class the prisoner receives only 5 per cent. of his earnings. He is not permitted to wear his beard nor to cultivate plants in his exercise-yard. He can have only such books as are selected for him and can correspond with his friends and receive their visits to but a very limited extent, and only in cases where it is believed that these influences will be decidedly beneficial. The aim is to lead the criminal to turn the mental eye inward and to reflect upon the past, so that he may better weigh the present and take care for the future. This self-introspection is thought indispensable to secure the sincere assent of the prisoner to the treatment of which he is made the object. Isolation and the visits of the officers are found to greatly facilitate the salutary reflections which it is sought to induce in the prisoner's mind. These reflections have also a deterrent effect, for all who have thus gone over their past lives have declared that, if they could at that moment have left the prison, it seemed to them that they would ever afterward have remembered the lesson thus received. Correctionals, sentenced to only a short imprisonment, do not get beyond this penal class, in which the discipline is intended to be of a deterrent character. Those who are sentenced to longer terms pass successively into the middle class and then into the superior.

There is no fixed minimum or maximum for separate imprisonment; its duration is in the discretion of the director. He holds, however, at the end of each month, a conference with the chaplain, school-master, steward, and chief warder, for the purpose of distributing the marks to which each is entitled for the month, for good conduct, for industry, and for attention to lessons: 0 signifies bad; 1, tolerable; 2, good; 3, very good. The maximum of marks attainable in a month, it is thus seen, is 9, as in the Crofton system. These marks, as well as the amount of earnings apportioned to him, are set down in the moral account kept with each prisoner. They are also transcribed into the memorandum-book of the prisoner, who is thus kept constantly informed of the judgment formed by the prison authorities of his conduct. The proportion of earnings accorded to prisoners in the middle class is from 5 to 12 per cent.; in the superior, from 12 to 20. In these two classes they receive a larger percentage of earnings in proportion as the aggregate is greater; nevertheless, the conduct of the prisoner and the degree of attention given to his lessons have their effect in diminishing or increasing the amount. Promotion from one class to another is determined by the prisoner's character, his antecedents, and the length of his sentence.

At the date of my visit—not counting correctionals sentenced to a short imprisonment—there were in the penal class 31; in the middle, 13; in the superior, 14. Among those in the superior class were a

number who had been in the prison ten, twelve, fifteen years, and who would have been free, if the principle of provisional liberation had been introduced into Switzerland. It is believed that this principle will soon have place in the Swiss legislation.

With a view to gaining the will of the prisoner to the system of discipline to which he is to be subjected, this system is explained to him as soon as he enters the penitentiary. His antecedents are made the object of a careful but kindly examination. He is aided by suitable suggestions in his endeavor to search into the causes which led him into crime. Each case becomes the subject of a serious inquest, and confidential information is sought from respectable persons by means of some such letter as this :

SIR: ———, of ———, aged ———, has just been committed to the penitentiary of Neuchâtel, to undergo there an imprisonment of ——— years. For the purpose of being able to direct his penitentiary education with some chances of success, we desire to obtain exact information concerning his family and the associations in which he has lived; concerning his education, his religious and scholastic knowledge, his apprenticeship, his occupation, his means of living, his character and moral habits; in a word, concerning all the points which might guide us in our task and enlighten us as to the causes which have conducted him into the pathway of crime. Knowing the interest you take in the unfortunate, we venture to send you the accompanying formula, which we ask you to return to us after having answered, confidentially, the questions contained in it. Thanking you in advance, we are, &c.,

[Signed by the director and chaplain of the penitentiary.]

* A formula is inclosed in this letter headed, "Confidential informations." Each page is ruled in two columns—the left containing printed questions, the right being blank to receive the answers. I print them solid, to economize space, and in a note, to avoid breaking the continuity of the text: 1. Name and surname of the prisoner? 2. Date of birth? 3. Place of nativity? 4. Legitimate or illegitimate? 5. An orphan? By loss of both parents? Of father? Of mother? 6. Since what age? 7. What was his education up to the time of entering the primary school? 8. Did he live at home? 9. Or was he placed at board? With whom and where? By whom? 10. How many years did he attend school? 11. In what place? 12. Was he studious? Did he show a taste for study or was he idle, indifferent, &c.? 13. At what age did he quit school? 14. What degree of learning had he when he ceased going to school? 15. Has he attended night-schools? 16. At what age did he pursue the course of religious instruction and ratify the vow of his baptism? 17. Have you noticed anything special in the character of this catechumen? 18. Has he undergone an apprenticeship? 19. What and with whom? 20. Did his master set him a good example? 21. What was the duration of his apprenticeship? 22. What company has he frequented? 23. After his first communion was he seen in the *cafés* making himself merry with wine? 24. Was he fond of gaming? 25. Has he traveled? In what countries? For how many years? 26. Has he served in foreign armies? 27. What was then his reputation? Was he a debauchee? 28. Are his parents still living? 29. What were their means of living? 30. Have they been convicted of crime? 31. Did his grandparents live in the family? 32. How many brothers has he? How many sisters? 33. By a first marriage? A second? A third? 34. How old are they? 35. What are their means of living? 36. Have any of them been in prison? 37. Have they a guardian? Does he do his duty by them? 38. Do you know of the existence of mental or physical maladies (insanity, epilepsy, &c.) in his family? 39. Is he married? 40. At what age did he marry? 41. Did he have the means of supporting a family? 42. What is the moral character of his wife? 43. Have they children? 44. How many? 45. Has their education been neglected? 46. Has it been a happy marriage? If not, to whom and to what do you trace the cause? 47. Have their children already been brought before the courts? 48. Was the prisoner orderly in his habits? 49. Was he industrious? 50. How much did he earn a day? 51. Is he a drunkard? A gambler? A debauchee? 52. Has he illegitimate children? 53. To what cause do you ascribe his misconduct and the crime he has committed? 54. Has he had troubles? Has death sundered the ties of family? Has he experienced reverses? 55. Has he relatives? Uncles? Aunts? What are their moral character and their social position? 56. Has the commune aided him, his relatives, or his family? 57. Who takes care of his family, now that he is in prison? 58. Might the prisoner, on his liberation, return to his previous abode, or would it be better that he change his associations?

Even in this small prison, with an average of only eighty inmates, from fifteen to twenty different industries are carried on, including shoemaking, tailoring, carpentry, smithery, coopering, turning, lithography, watch-making, book-binding, basket-making, brush-making, gardening, &c. Every prisoner, not already master of a trade on his entrance, is allowed free choice of any of those pursued in the prison. The foremen work with the prisoners precisely as a boss mechanic works with his apprentices. There are never more than four workmen in a shop, but others are often working at the same trade in cells, who are instructed and supervised by the same foreman. While he is attending to them, the prisoners in the common shop are left alone, but they are as diligent in his absence as when he is present. In a great work-shop, where the keeper is always on an elevated platform, with no other occupation than that of overseeing a number of men working in silence, it is impossible for him to give the good example of industrious labor himself. Such a system is believed by Dr. Guillaume to be as pernicious for the prison employé as it is for the prisoners. For this reason he gives the preference to the system which approaches nearest to that of the free work-shop, and it is on this account also that *the law of silence does not exist* in the penitentiary of Neuchâtel. The same usage is found in the penitentiary of Bâleville, the rule of silence not being enforced there. This relaxation is upon the ground (the director of that prison says) that the liberty of talking openly, within fitting—that is to say, moderate—limits, makes the prisoners more frank and sincere, since it frees them from the necessity of resorting to devices for the purpose of communicating with each other. In the other Swiss penitentiary establishments the rule of silence exists. But Dr. Guillaume insists, and, indeed, it is well known to all conversant with the subject, that prisoners find a certain charm in breaking this rule, and that they succeed in doing so only too often. It is for that reason that he does not attempt its enforcement in his establishment. He holds that it is artificial, that it is consequently irrational, and further that it is little adapted to the training process to which prisoners, if they are to be reformed, must be subjected after the penal stage. In his own prison, where the foreman (who is a prison officer) works with the convict laborers, and every one is busy, there is very little conversation, and what is said relates to the work. At the ten-minute recesses, at 10 and 4 o'clock, conversation, directed and maintained within the limits of propriety and self-respect by the foreman, is found, instead of being hurtful, to have an excellent effect. For the most part it turns upon the subject of the last school-lesson, the mathematical problem given out to be solved, or the conference of Sunday, at which the employés, as well as the prisoners, are required to be present. The presence of the foreman is considered by Dr. Guillaume necessary, in order that, through his moral ascendancy, the conversation may not degenerate into grossness and obscenity. So far, on a three years' trial, the authorities have only had occasion to congratulate themselves on the results of this system, which seems to be in accordance with the inward and essential nature of man.

Labor in association is restricted to the prisoners in the middle and superior classes, and is accorded to *them* only when the accommodations and the kind of industry permit. Many remain in their cells even after having been promoted to the higher classes. The lack of suitable accommodations prevents their introduction into the workshop, and deprives of its greater freedom and privilege many who have shown themselves worthy of such indulgence. Such relative liberty Dr. Guillaume

considers a necessity in this stage of penitentiary discipline. This inconvenience would disappear if there were three prison buildings—one for each class—in which the arrangements were adapted to the end in view, and to the necessities of each of these successive stages. The prisoners in passing from one establishment to another would *see* the progress made toward their liberation. Under the same roof it is difficult to establish and to make sensible the distinction between the two higher penitentiary classes. For this reason Dr. Guillaume is a partisan of the Crofton system in its strictness.

As regards discipline, no corporal punishments are allowed. The punishment-cell and a diet of bread and water are authorized by law, but they are now never employed. Deprivation of work in an ordinary but empty cell is the severest disciplinary punishment at present in use. *Ennui* is found an effective means for conquering the most obstinate, especially if they have been treated with kindness and justice. The punishment-cell, it has been found, often makes martyrs, and it is not well to make martyrs in a penitentiary any more than in politics and religion. For an officer to lose his temper and speak with anger to a prisoner who has been guilty of a breach of discipline, is to approach the lower moral level of the prisoner himself, and to give him reason to believe that he has not deserved so rigorous a treatment. For this reason Dr. Guillaume makes it a rule to treat prisoners as the insane are treated, whose ill-conduct never provokes the wrath of the physician, but rather his compassion. He makes them feel, by words calm and self-restrained, that he is pained to perceive that they do not know how to govern themselves, and that they have not yet attained that self-control, that mastery of their thoughts and acts, that dignity, in a word, which belong to men who respect themselves. This mode of treatment, employed with tact and a skillful adaptation to each prisoner's special character, has shown itself effectual. It requires more *patience*, greater *effort*, and a longer *time*, than the expeditious punishments of the lash, the douche bath, the dungeon, and other similar inflictions; but the most recalcitrant yield to it in the end; and—a material consideration—without any waste of the prisoner's inward moral forces, but rather a toning up and strengthening of his entire moral being.

With a view of having a number of moral punishments, there have been introduced into the penitentiary of Neuchâtel a number of moral rewards and encouragements. The withdrawal of these latter constitutes a punishment far more sensibly felt, and therefore far more efficacious, than the rigors of the old *régime*. It would be difficult, if not impossible, to enumerate all the rewards held out to win back the prisoners to virtue's paths, for they are often suggested by special tastes and desires, which take on an endless diversity of forms. Some of them, however, may be named, which will serve to give an idea of their variety. They are: 1. Promotion, speedy if deserved, from class to class. 2. The privilege of apprenticeship to an interesting trade, such as lithography, book-binding, or any other that may be preferred. 3. Increase of the proportion of earnings. 4. Permission to use a part of these in the purchase of books, popular illustrated journals, scientific and literary, engravings to adorn their cells, and tools wherewith to occupy themselves in their own time. 5. Permission to wear a watch, or have a thermometer. 6. Permission to wear their beard. 7. Permission to cultivate flowers and vegetables in the little garden of their exercise-yards, and, by consequence, to have flowers in their cells, and oil and vinegar for salad. 8. Permission to receive the visits of their relatives in the office of the director, and not in the prisoners' conversation-room.

9. More frequent leave to write letters to their friends. 10. Permission to purchase articles of clothing, for example, cravats, to wear on Sunday. (Under this head Dr. Guillaume expressed a hope that the time might come when the superior class should have, on Sunday, a special suit of clothes, including leather shoes—clogs only being now permitted by the rules—thereby contributing not only to their comfort, but to their self-respect and personal dignity.) 11. Permission to learn to play on the *zithare*, a small musical instrument, of thirty cords, making so little noise that it is scarcely heard in the adjoining cells. 12. The privilege of choosing books for themselves out of the prison library. 13. To draw, (especially to make mathematical drawings.) 14. To read the technical journals taken by the administration. 15. Admission to positions of trust; for instance, in the distribution of meals, in the bureau, and in other services of the house, as temporary aids. 16. Permission to superintend the apprenticeship of fellow-prisoners in the middle class.

Long and noble as this catalogue is, a grave omission is observable in it.

Abbreviation of the term of imprisonment is not among the incentives held out to the prisoners of the Neufchâtel penitentiary to quicken their endeavors toward a better life. Yet nothing is so sweet to the human mind, nothing is so much coveted by it, as liberty; and nothing, therefore, presents so powerful a motive to exertion as the hope of shortening the period of captivity, if only for a few days; how much more when the term is months, or even years. Dr. Guillaume is quite sensible of this, and hopes, as all must, that Switzerland will not have to wait long for this great step in prison reform.

Among the encouragements there is also one (not set down in the above enumeration) which I cannot approve, and which will not be approved by my countrymen; but it is in accordance with European (continental) sentiment and usage. It is permission to occupy Sunday afternoon in small industries on their own account, such as embroidery, (*broderie*,) the coloring of engravings, the manufacture of little wooden baskets, &c. This is contrary to American and English ideas of the sanctity of the Sabbath; and we think we draw our ideas from the word of God, which we regard as the ultimate standard of faith and morals.

The withholding of the rewards and favors accorded to prisoners are the punishments employed when the private exhortations of the director produce no result. Admonition, kindly exhortation, the appeal to honor and manhood, are the first punishments, if that is not in this case a misnomer, and they are sufficient in a great number of cases. If there is a repetition of transgression, the withdrawal of a reward follows, and that is chosen whose loss will be most sensibly felt by the prisoner. Here individualization, as a matter of course, comes in. If the prisoner shows himself submissive, if he feels that he is justly punished, and if he conducts himself in an exemplary manner for some time, the punishment ceases, and he again enters into the possession of the forfeited privilege.

Permission to wear the beard is a privilege greatly prized. Hence, the punishment which consists in a removal of this token of manhood is proportionally dreaded. The simple threat to cause a prisoner to be shaved for an offense is, in many cases, enough to prevent a repetition of it. Others are less sensitive on this point. It is necessary to individualize, and not—such is the opinion of Dr. Guillaume—*humiliate*, the prisoner. The punishment should in no case wound his self-respect, which he never wholly loses, though at times it sinks to a very low plane. This sentiment rises in the prisoner in proportion to the esteem which is

shown him; and it is, above all, when called upon to punish him, that we should never forget that he is a man, our brother. In making him feel this, he will comprehend his own responsibility, and a feeling of shame will be awakened in his breast. This sentiment is feeble at first, but it grows and strengthens in proportion as the work of reformation advances. It is this vital fact which explains why, in the penitentiary of Neuchâtel, there is neither corporal punishment, nor chains, nor prison garb, nor *gens d'arms*, nor armed or even uniformed officials. The constant endeavor is to place the prisoners in conditions similar to those which are found in respectable mechanics' families, where labor, order, economy, and intellectual recreations are held in esteem.

An effective school is maintained in the prison, on one of whose sessions it was my pleasure to attend. It is divided into three classes, and, so far, is upon the model of the ordinary primary schools of the country. The average attendance for the year has been, in the lowest class, ten; in the middle, thirteen; in the highest, fifteen. All the other prisoners receive lessons in their cells. A schoolmaster devotes his whole time to the work of instruction. Admission to the school is made a recompense of good conduct, and is found to be a strong stimulus to such conduct. To all such, admission is an occasion of rejoicing and a source of satisfaction. A withdrawal of its privileges, for ever so short a time, is felt as a punishment. On entering the school, a written examination takes place, and this is repeated at the end of each month. The pupils are classified by its results. The order of the examination is as follows: 1. Date. 2. Name of prisoner. 3. An exercise in reading. 4. Solution of a problem in arithmetic. 5. Geography, questions and answers. 6. History, same. 7. Composition, on a subject assigned or freely selected. 8. Dictation of several sentences.

The branches taught are reading, writing, arithmetic, geography, history, and the natural sciences. Each lesson begins with the reading of a piece selected from a school-book used in the public schools of the country. The piece to be read is announced at a previous school session, so that the pupils may prepare themselves to ask the schoolmaster questions on the subject to which it relates. He solves their difficulties, and adds such comments as he deems fit. He then gives oral lessons in geography, history, &c.—lessons which have been suggested by the piece read, or the questions asked. The endeavor is always, as much as possible, to give the practical side of things, so as the better to awaken the interest of the learners. The problems given in arithmetic and geometry are invariably such as admit of an immediate application.

As soon as they have arrived at the point where they are able to do so, the pupils are expected to keep a journal, in which, among other records, they give a summary of the lesson of each day, and some of these abridged statements are read at every school session. I was greatly interested in the compositions of this kind which were read on the day of my visit, all of which were on the subject of glass, giving an account of its elements, manufacture, uses, history, &c., &c. They gave token both of the thorough manner in which the teacher had imparted his instructions, and of the close attention with which they had been listened to by his convict scholars.

On every Sunday morning, the hour immediately preceding divine service is devoted to a lecture by the director on whatever subject he may choose to address his audience, which is composed of all the employés and prisoners of the establishment. His range of topics is wide, including biographies of celebrated men sprung from the ranks of the people, (Benjamin Franklin, John Bright,) philanthropists, (John How-

ard, Florence Nightingale,) striking events of the day, (the arbitration at Geneva,) new inventions and discoveries, (the electric telegraph, the microscope, the mowing-machine,) questions of a literary or scientific character, geography, history, astronomy; everything, in short, which constitutes a human interest or contributes to human progress. Before the lecture commences, Dr. Guillaume is accustomed, for a few moments, to pass in review the general conduct of the prisoners, and to give them his thoughts on lying, on idleness, on want of cleanliness, on indifference, on levity of character, on impoliteness, on thoughtlessness, on inattention to order, or some other of the numerous points embraced under the general designation of minor morals. In the afternoon of Sunday the prisoners are required to write compositions, either on the subject of the morning's lecture or on some other topic given out in class. As further subjects of composition, there are distributed copies of some engraving—"Our Father which art in Heaven," or some other; and they may then exercise themselves in a description of the engraving, and in expressing their sentiments on what it represents. These compositions are compared, their relative merits weighed, and the best of them selected for insertion in a little autographic journal, of which some account must now be given. This is a paper under the title of *Travaux d'Ecole*, (*School-Work*), edited and published in the penitentiary every fortnight. Each number occupies four pages of square letter-paper, (large size,) and is illustrated by one or several pictures, the whole lithographed by the prisoners. It contains compositions, puzzles, arithmetical problems and their solutions, &c., mostly by the convicts, moral and instructive sentences, selected from eminent authors, and a variety of other matters. One needs but to glance at a few numbers of this unique journal to satisfy himself that the educative and reformatory power embodied in it must be great indeed.

As a still further encouragement to diligence in learning, there are distributed at the end of every month, after the customary examination, engravings, books, crayons, &c., to those who have distinguished themselves.

Each class has an hour in school daily, and those who are in cellular confinement receive also the daily visit of the teacher. This is especially the case with the new-comers and the abecedarians. These last are not admitted into class till they are able to follow readily the reading which takes place there.

The penitentiary has a library of nearly 500 volumes. The school-master has charge of it and superintends the exchange of books. But it is his duty not to permit an exchange till he has satisfied himself that the applicant has really read the book he is returning, and has profited by it. The prisoner who wishes to be sure of receiving a new book writes in his journal a *résumé* of his reading, and copies the passages which have most interested him by their sentiments or their style. In this manner the more zealous come at length to find themselves in possession of a collection of maxims, sentences, pithy sayings, proverbs, and the like, drawn from the authors whom they have read.

In the visits which Dr. Guillaume is accustomed frequently to make to the school-room, he takes occasion to ask one and another what book he is reading at the time, and he requires the prisoner so interrogated to give him some account of it. This suggests reflections on the manner of reading books so as to derive the greatest advantage from them; and the observations addressed to one become profitable to all.

The journal is not, strictly speaking, obligatory; but all know that to have one is to conform to the director's desire. It is simply a copy-book,

in which the prisoner sets down each day what he has done, and the reflections suggested by his reading, his lessons, &c.; also his observations on the weather and the periodic phenomena of the plants in his garden, on the trees of the neighboring forest, the birds which he hears sing, the visits made to him, the letters received or sent, the sermon of Sunday, the visitors seen in the chapel, &c., &c.

The schoolmaster is required to submit to the director a monthly report of the condition of the school and the progress of the scholars. One of these, in manuscript, was placed in my hands, and now lies before me. It is a curious and instructive record. Eleven prisoners had been admitted to the school during the month. The result of their initial examination showed that one only had a *tolerable* primary education; the other ten, *bad*, reading and writing with difficulty. Nine had left the school, their term of sentence having expired. Of these, the primary education of two was *good*; of two, *tolerable*; of five, *bad*. The two noted as good had been four months in attendance; the others were short-term prisoners, *correctionals*. The distribution of the school into classes was: In the inferior, 18; in the middle, 18; in the superior, 11; total, 47. The number of weekly lessons given to each class was 6; total, 18. The course of study for the month had included, in geography, the principal mountains, valleys, rivers, and lakes of Switzerland, its different cantons and capitals, the products of its soil and industry; in Swiss history, the leading events of the fourteenth and sixteenth centuries; in inventions, the telegraph; in arithmetic, numerous practical problems, with the bearing of each, and exercises in class. The master further reports that he has examined the summaries made by the prisoners of the contents of the books read by them during each week, and that the result of the usual monthly examination had been, upon the whole, satisfactory. The subjects of the pieces read in class, and of the compositions written on them, are reported as glass, porcelain, clothing, mountain birds, the cork-tree, consumption of alcoholic drinks in England and the canton of Berne, statistics of intemperance and considerations upon it; petroleum, and the quantity exported from America; different systems of lighting, &c., &c. Thirty hours are reported as having been devoted to giving lessons in the cells. He puts down as the subjects of Dr. Guillaume's Sunday lectures for the month: August 4, An account of his voyage from Neuchâtel to England in a geographical point of view, means of communication by railway and steamer; August 11, Interesting fragments from Macaulay's History; August 18, Miss Mary Carpenter and her labors; August 25, Climates, with a picture showing the plants and animals of the different zones. The report embraces other points which I omit, and closes with a hearty tribute to the diligence, zeal, interest, and good conduct of his convict pupils.

I was anxious to ascertain whether the public opinion of the prison could be so developed and directed that it might be made to react effectively upon the prisoners as one of the governing forces of the establishment. On this point I interrogated Dr. Guillaume closely, and his account of the matter was substantially as follows: He conceives that such as are the employés, such will be the prisoners; that if the former comprehend their mission, possess the necessary tact, and make themselves respected by their conduct and their conscientious industry, (for they are required to work no less than the prisoners,) the latter will imitate them in well-doing, and all will contribute and unite their influence in maintaining the order and discipline of the establishment. Consequently, his first care is directed to the officers. To develop their inter-

est in the work, he holds frequent reunions of the foremen and other employés, and gives them familiar lectures, or, as he styles them, *conferences*, on the history of penitentiary reform, on the various systems employed to effect the reformation of criminals, and on the duties of persons charged with so high and responsible a function. These conferences have for object the familiarizing of the employés with the service, and especially with the spirit which has dictated its rules and regulations. In making apparent to their apprehension how great and noble is the mission of laboring for the reformation and future well-being of their fallen brethren, the employés, if they have the necessary aptitudes, begin to comprehend how important is the part which they are called to play, and by degrees they come to realize the dignity of being responsible agents, and to feel a pride in their work. They no longer look upon themselves as mere turnkeys and jailers, but rather as guides, teachers, trainers, who must, above all, preach by their example. They have, severally, at heart the good order and discipline of their ward—that is, of the prisoners who are placed under their special care. Emulation develops itself among them, and they seek to rival each other in zeal for order, decorum, good manners, politeness, industry, &c. Each one is anxious to have the cleanest and most orderly ward, and the best arranged, best kept, most industrious, and most successful workshop.

As regards the penitentiary public, this *esprit de corps* makes itself equally felt, insomuch that it produces in all the employés a desire to maintain the good repute of the establishment. The penitentiary is for them their family.

At the last industrial exhibition in the canton the penitentiary coopers obtained a medal, and the gardeners a prize, since which time there has been established a traditional reputation, which will doubtless be maintained, for the prisoners have become imitators of the keepers in their *esprit de corps*. On the occasion of the exhibition, the prisoners were anxious to prove to the public that they knew how to work, and that in due time they would be worthy to re-enter society. The press, on this occasion, indulged in a variety of criticisms, but the public showed itself favorable to the introduction of industrial occupations into the prison, and the admission of the products of prison labor to this general exposition of agricultural and mechanical industry.

Owing to the sagacious and comprehensive combinations of Dr. Guillaume, as explained above, the public opinion of the prisoners is such that it exercises a strong power of control over them. Often, by their remonstrances and their influence, they repress the evil thoughts which occasionally show themselves in one or another of their comrades. Among the motives impelling them to act in so praiseworthy a manner is the fear of forfeiting or lessening the fair reputation which may have been won by their shop. Dr. Guillaume explained, and seemed very desirous that I should comprehend, that, in speaking of evil purposes formed by individual prisoners and suppressed by the force of public opinion, he alluded to trivial offenses—mere breaches of discipline—for they never had had cases of gross insubordination, revolt, and the like—cases which, indeed, they had come to regard as of almost impossible occurrence.

Various books of record, in addition to accounts-current, are kept by the authorities, in which are noted different classes of facts relating to the prisoners. I propose to make but brief reference to only a portion of them. One contains the most complete statement attainable, whether from the prisoner himself or from trustworthy persons in the locality from which he came, of his antecedents, character, habits, occupation, relations, value of the property stolen, if his crime was theft, &c., &c.

Another opens a moral account with him, in which a continuous record is kept, month by month, of his conduct, industry, and habits of study, according to the following form :

Names.	Month of ———.				
	Conduct.	Industry.	School.	Total of marks.	Earnings.
A	3	3	3	9	3f. 60c.
B	2	2	2	6	2f. 80c.

A column is added for general remarks. The marks are settled, as already explained, in the general conference of officers at the end of each month.

In addition to this there is for every prisoner a file or bundle of papers, (*dossier*,) in which are found : 1. The charge, sentence, &c., of the court. 2. Official and confidential information obtained relative to the prisoner's antecedents. 3. A short account of his life, written by himself or at his dictation. 4. The result of his scholastic examination on entrance. 5. A monthly transcript from the moral-account book and the punishment record. 6. His photographic likeness when committed. 7. Good or bad facts relating to his conduct. 8. His photograph on leaving the prison. 9. Facts relating to the aid given him at his discharge, (*son patronage*,) and his conduct after liberation.

The *cantine** does not exist in the penitentiary of Neuchâtel, nor is it in contemplation to introduce it. It is believed there that such an institution must end in demoralizing both officers and prisoners, and that therefore the fixed dietary of the prison ought to be made sufficient to satisfy all fit and reasonable wants.

During the few days I passed at Neuchâtel I mingled freely with the prisoners, conversing with them *ad libitum* without the presence of an officer. I found the best spirit and the best state of feeling existing among them. Of not a few the love to Dr. Guillaume seemed like that of children to a father. I verily believe that there are prisoners in that penitentiary whom this feeling would hold there as with chains of steel, if every bolt were removed, and every door set wide open, thus proving again the truth of Dr. Wichern's paradox, that "the strongest wall is no wall."

It will be asked, What about the earnings in a prison which seems so much like a university, and where every thought, contrivance, and effort appear to be given to the reformation of the convicts ? I am happy to reply that they are nearly enough to meet all the current expenses of the establishment, and, in all probability, will reach that point in time. They are greater to-day, man for man, than in any other penitentiary establishment in Switzerland.

Another and still more important question is : What reformatory results are shown ? To this question I make answer : The experiment is yet in its early infancy. At the time of my visit, scarcely two years had elapsed since the accession of Dr. Guillaume. In the most remark-

*This is found in all French and perhaps most other continental prisons. It may be described, in the most general terms, as a privilege of purchasing additional comforts, not included in the legal rations, with the prisoner's *disposable peculium*—that is, such part of his earnings as he may spend while still in prison.

able and most successful experiment in prison discipline that perhaps the world has ever seen—that of Colonel Montesinos in Spain—which finally brought down the recommittals from 40 per cent. to zero, no visible results, as far as statistics are concerned, were shown till after the completion of the third year. As regards Dr. Guillaume's experiment, if he does not in the end bring down the percentages of relapses gloriously, reformatory prison discipline must be a delusion; those who seek to inaugurate it are chasing a bubble; and the best thing society can do will be to hang, shoot, or decapitate every man whom it can catch and prove to have committed a crime.

§ 2. *Reformatories in Switzerland.*—Most of the Swiss cantons seem well provided with juvenile reformatory institutions, of which, however, the time at my command permitted me to see but one, and of that to take but a cursory glance. It is an agricultural colony or reform school, two miles from Berne, conducted on the family plan, with twelve boys in each household, under a house-father. The establishment appeared to me well kept in every respect, and the appearance and tone of the inmates excellent. Results good, few of the boys returning to crime.

CHAPTER XXXIII.

PERSONAL INSPECTION OF PRISONS IN GERMANY.

§ 1. *German convict-prisons.*—Of these my limited time and the pressure of duties belonging to the leading department of my mission allowed of an inspection of but three—the Moabeit prison, at Berlin, Prussia; the prison of Brüchsal, Baden; and the prison at Munich, Bavaria, formerly under the care of the celebrated Obermaier—all of them among the most renowned of the penal establishments of the empire.

(a) *The convict-prison at Berlin.*—My distinguished friend Baron von Holtzendorff and the illustrious Dr. Wichern being both absent from Berlin at the time of my visit, I was compelled to make my inspection of this prison alone. The Moabeit is a prison constructed on the panoptic or radiating cellular plan, with four wings and five hundred and eight cells, besides underground workshops sufficient for one hundred and fifty men, and a farm, at some distance from the prison, to give employment to those prisoners who, on account of bad health, age, or length of sentence, cannot serve out their entire term in separation. The prison is managed by a Protestant brotherhood, called the Brethren of the Rauhe Haus, and trained, therefore, by Dr. Wichern for the work of the Inner Mission. The average of relapses is about 13 per cent. Though having no permit from an official source, I was received with much courtesy by the director, a gentleman of great benevolence of character, but unfortunately knowing nothing of English, French, Spanish, or Italian, a catalogue which exhausted my own powers of speech. He began by showing me a complete set of drawings which exhibited the prison in all its parts, and, being in a universal language, were readily comprehended. He then conducted me through the establishment, entering at least fifteen to twenty cells, where I had an opportunity of seeing the prisoners at their different occupations. These were quite various, and embraced lithographing, engraving, carving in wood, &c. The manner of his intercourse with the prisoners pleased me exceedingly, marked as it was by a gentle and kindly spirit, with

nothing of official stiffness. The visit was in all cases commenced by a friendly greeting, and on leaving the director bade each one adieu, with sometimes an added hand-shake. As we passed along he explained everything in *German*, just as if I had understood a word of it! The prison I found kept in the neatest manner; the prisoners had a cheerful look; every cell (for we peeped into many which we did not enter) seemed a little home of solitary industry; material wants were well provided for; and the director was evidently a favorite with the inmates. Beyond this I cannot go. It was the shell only that I saw. Visiting prisons with no power of intercommunication is but a sorry and certainly a most unsatisfactory business.

(b.) *The convict-prison at Bruchsal.*—This is the model cellular penitentiary of Germany, and the oldest, having been opened in 1848. Like the Moabit, at Berlin, it is on the radiating plan with four wings. The number of cells is four hundred and eight. A model prison itself, it has a model director in Herr Ekert, whose administration combines, in admirable proportions, justice with mercy, firmness with humanity, and breadth of scope with a minute attention to details.

Most of the German states have three, many of them four, different kinds of public punishment. Punishment of the highest degree, awarded of course to the highest crimes, is condemnation to the *zuchthaus*, (house of correction.) Prisoners so sentenced lose their civil rights. The maximum sentence is for life; the minimum, two years. The second degree is termed *arbeitshaus*, (work-house.) Condemnation to this punishment varies from a few months to several years, but it does not extinguish municipal rights. As its name implies, it involves compulsory labor the same as the *zuchthaus*. The third degree is called *gefängness*, (jail.) This sentence does not make labor obligatory, but allows "occupation in accordance with the social position and ability of the prisoner." A fourth kind of punishment—it can hardly be named a *degree*—is termed *festung*, (imprisonment in a fortress.) It is a punishment awarded to gentlemen offenders; mostly in cases of political crime or dueling.

But I seem to hear the inquiry, What has all this to do with the penitentiary of Bruchsal? Not much, perhaps, but at least this: Formerly the establishment at Bruchsal united in itself two prisons, the *zuchthaus* and the *arbeitshaus*. The prisoners of each class were in nearly equal numbers, and, though nominally under different rules, were both subjected to the same system of absolute isolation. But the system of mixing the two classes has been abolished. None but the higher criminals are received at present, so that the penitentiary has become strictly a convict-prison. Although the system is intended to be rigorously cellular, there is a department of the prison, called the "auxiliary establishment," where association is permitted to the following classes of prisoners: 1. Those who have been in cellular separation six years, unless they elect to remain in isolation. 2. Old men who have passed the age of seventy. 3. Prisoners adjudged not fit for cellular separation on account of the state of their health, bodily or mental. There were some twenty or thirty persons in the auxiliary establishment when I was at Bruchsal, out of a total of 384. In point of fact, not more than an average of nine per cent. are detained for periods exceeding four years. Though a zealous supporter of the separate system, Mr. Ekert states, in one of his reports, that after three years of cellular confinement the muscular fiber becomes remarkably weakened, and that, after that, to require hard work would be tantamount to requiring an impossibility.

Mr. Ekert conducted me through every part of his admirably arranged and admirably managed establishment, and explained the multiplied details of its organization and working. I cannot stay to repeat his statements at any length. The different occupations of the prisoners run up to eighteen or twenty. Every prisoner learns a trade, who was not master of one before his committal. To some extent the prisoner's own preference is consulted, but the great study is to give him a trade that will enable him to earn an honest living after his discharge. It may be stated here that while only three or four per cent. of the convicts are wholly illiterate when received, more than half had not learned a trade. They are encouraged and incited to diligence by being allowed to share in the product of their toil. Two chaplains are employed, one for the Catholic, the other for the Protestant prisoners, who severally hold service twice on Sunday and once on Wednesday, besides doing abundant pastoral work in the cells. Two schoolmasters also devote their whole time to the work of scholastic instruction in the cells. An annual examination of the prison pupils takes place, (the interval is certainly too long,) at which premiums are distributed to the deserving, consisting of books, copies for drawing, tools, &c., &c. Upon the whole, the training, schooling, industrial employment, and religious care of the convicts appeared to me to be in a satisfactory condition.

The superior officers meet every day in the office of the director for conference, when they make report of their respective observations for the last twenty-four hours, and take counsel together for the future.

(c.) *The convict-prison at Munich.*—This penitentiary, placed a little outside of the city, was the scene of Councilor Obermaier's labors, who, however, long since—more than twenty years, I think—retired from it; but he still lives, a vigorous and honored octogenarian. I called at his residence in Munich, with the great infelicity of finding that he had gone to spend a month in the Bavarian Alps; and so I missed seeing the man whom, of all others living, I should most desire to converse with, since Maconochie and Montesinos have both been called to their reward.

Mr. Petersen, who was a delegate from the Bavarian government to the congress, accompanied me to the prison. We found (which was another disappointment) that Mr. Mess, also a Bavarian government delegate to the congress, who is the present director, had departed on leave only the day before. We were, however, courteously received by the sub-director and chaplain, the former of whom conducted us through the establishment, giving all needful explanations.

The prison was originally a monastery, and has been adapted to its present use. It is of great extent, but extremely irregular. Every part was found to be clean, sweet, and in good order. There are fifty-seven cells for separate imprisonment, all but two having occupants the day I was there. Beyond that the establishment is on the congregate plan. The entire capacity is for five hundred and fifty; there were four hundred and ninety-nine at the time of my visit. It is a convict-prison, (*maison de force*), and none are admitted but those sentenced to hard labor, (*travaux forcés*.) In Obermaier's time, and since, sentences were from five years to life. Now the shortest are for one year. There were fifty-two life-prisoners. Most of those who have this sentence die in prison; few ever receive a pardon.

Contraband traffic, especially in tobacco, is the offense oftenest committed. The punishments are reprimands, diminution of rations, privation of peculium, confinement in a cell, the dungeon, and, in bad cases, irons. Corporal punishment has been abolished since 1861. It

is gratifying to know that since its abolishment the number of offenses has greatly diminished. Prior to its prohibition the prisoners—so it was reported to me—were in a constant state of irritation, and open revolt was not infrequent. Since then nothing of the kind has occurred. The prisoners are tranquil and docile. School is held daily for two hours. There are six classes, and each class receives two hours' schooling per week. Better would it be to double the dose. The branches taught are those common in primary schools, with a little chemistry and natural science superadded. The progress made is fair.

As in Baden, the prisoners nearly all know how to read when committed; but the greater part have not learned a trade. The industries pursued in the prison are many, including lithography, book-binding, shoemaking, spinning, weaving, painting, carpentry, &c., besides domestic labors and other work for the establishment, in which thirty-eight prisoners find employment. The net earnings in 1871 amounted to \$11,977, which was considerably more than sufficient to meet a fourth of the expenses.

The prisoners sleep as well as work in association. Obermaier had a strange liking for this system, and no doubt his extraordinary genius for controlling bad men and molding them to his will enabled him to overcome many of the evils inseparable from it. It is, however, inherently and ineradicably vicious, and is now condemned by the common judgment of the world.

The prisoners take their dinner at 11 a. m., after which they are permitted to amuse themselves in the large courts or yards of the prison till 1 p. m. They are supervised by keepers during this hour and a half, but otherwise are quite unrestrained. Passing through the different courts, I observed that all were perfectly well-behaved. They conversed freely together and engaged in a variety of amusements, but without tumult, disorder, or anything approaching to unseemly or excessive noise.

I made special inquiry as to the influence of so unusual an indulgence, and the answer received was substantially as follows: At their promenade in the courts, the prisoners are allowed all possible liberty. They choose their company and their subjects of conversation as they see fit. This system, far from being attended with evil consequences, is found preferable to that which forbids all converse. Down to 1862, this prohibition had effect. But obedience to such a rule was found impossible to be enforced, and its infraction drew after it a multitude of punishments whose only effect was to harden even the better prisoners, and to paralyze the softening influences of the school and the church. Nevertheless, to guard against the evil which might be done by the worse to the better prisoners, the former are excluded from these collective recreations, and are required to take their exercise in separate yards, which is a quiet but powerful means of maintaining order and preventing excesses in the associated courts.

§ 2. *Detention prison at Munich.*—After inspecting the convict-prison, Mr. Petersen and myself made a short visit to the detention prison, in the city, for the confinement of persons awaiting trial or transfer after conviction and sentence. This is a new prison, opened two years ago. It is upon the cellular plan, as all prisons of this kind ought to be, with accommodations for fifty men and fifteen to twenty women. A very few receive short sentences to this prison, but they are quite exceptional cases. It is not intended as a punishing prison, but simply a prison for safe custody. Labor is not exacted, but such as have a trade are permitted to work at it as far as there is opportunity, and are entitled to

whatever they earn. It is truly a model prison of its class. I was pleased with the director and particularly with his wife, whom I found intelligent, cultivated, amiable, and deeply interested in the future of the prisoners.

§ 3. *Patronage of discharged prisoners in Bavaria.*—The work of aiding discharged prisoners is admirably organized in this little kingdom. On leaving the detention prison, we drove to an asylum or refuge for liberated prisoners, who, on discharge, have been recommended for aid by directors of prisons to the patronage society of Munich. It is a house, with garden attached, having accommodations for fourteen men and ten women, the two sexes occupying distinct parts of the establishment and being wholly separated from each other. A porter and his wife are in charge, by whom everything is kept in perfect cleanliness and order, thus giving the place an attractive and home-like air. It is simply a transitional home for the inmates, bridging over the chasm between the prison and steady work. While waiting for this latter, the ex-prisoners either busy themselves with odd jobs obtained in the city, or in working for the house—splitting wood, making shoes, cultivating the garden, &c. There were but three in the refuge when visited by me, and they were all employed on city jobs. Their average stay in the home is about two weeks.

I had the pleasure of attending one of the sessions of the committee of the patronage or aid society of Munich, and was greatly interested in the proceedings. The business was conducted with much animation, amid a generous flow of Bavarian beer. The speeches were interpreted to me by a Dr. Strauss, and interested me greatly, particularly those on a rather novel application, which created considerable merriment, asking for money to enable the applicant to get married.

It will, I think, be worth while to go a little into detail on the organization and work of the Munich society and the general question of patronage in Bavaria. The aid society of Munich was formed in 1860, having for its object the moral improvement and material well-being of liberated prisoners who are citizens of Munich. It makes no distinction in respect of age, sex, or religion, but gives special attention to young persons of both sexes. It has a capital, including the refuge before described, of 10,060 florins. Its receipts in 1871 were: subscribed and paid by members, 1,580 florins; appropriation by the state, 750 florins; interest on capital, balance from 1870, &c., 946 florins; total, 3,276 florins. It has a membership of 1,550, composed of ladies as well as gentlemen. Each member must pay 36 kreutzers a year. Larger contributions are received from many, but they are free-gifts. The society holds only an annual meeting, but a committee consisting of forty-two members meets every Monday night. The following is the order of business: 1. It deliberates on the reports sent from directors of prisons, giving information that such and such prisoners are to be discharged, and also in relation to their character. 2. It considers and decides on the admission of these prisoners to patronage. 3. It chooses from among the members of the society guardians to take charge of such prisoners as are accepted. 4. It considers communications sent in by guardians, relating to the conduct of their wards, and decides upon the assistance to be given to these latter. 5. It acts on any financial questions that may arise.

The special duties of a guardian are: 1. To maintain a constant and paternal watchfulness over his ward. 2. To procure for him remunerative work, and to be his protector. 3. To provide for him clothing,

tools, money needed to travel in looking for work, and even, when occasion requires, to furnish him with lodgings.

Each ward has his special guardian who watches over him, counsels him, supplies his most pressing wants, takes charge of any money appropriated by the society for his use, and, if there be a necessity, endeavors to effect a reconciliation between him and his family.

The results are scarcely such as would have been expected from so much labor and care. Of the 1,182 persons who have been received as wards of the society since 1860, 377 have relapsed; 162 have withdrawn themselves from all supervision; 264 are doubtful; 27 have died, and 352 have undergone a radical change, and become completely reformed in principle and life.

In the province of which Munich is the capital city there are twenty-five districts. Societies similar to that of Munich are found in the chief cities of thirteen of them, and steps have been taken to organize like associations in the other twelve. These local societies are in all respects formed upon the model furnished by the society of Munich. Each is independent, yet all have in the committee at Munich, as it were, a central organ, which forms a bond of union between them, awakens mutual sympathies, makes them feel that they have common interests, and occasionally even advances funds, which are sometimes deficient in country organizations.

Bavaria embraces eight provinces—seven besides that of which Munich is the capital. The greater part of the chief cities of these have also their patronage societies, and very many of the small towns as well—some sixty in all; so that, including those in the metropolitan province, Bavaria, with a population scarcely, if at all, exceeding that of New York, has at least eighty prisoners' aid societies, all of them organized on the plan of that at Munich, even to the holding of weekly meetings on Monday night. The state encourages these associations with small grants of money for their work; but the most effective aid they have consists in this, that, six weeks in advance of the liberation of a convict, every prison gives information of this fact and of his character to the association which takes charge of its prisoners. The chief obstacle encountered by these associations is the distrust of the public and the prejudices which it feels and shows against contact with liberated prisoners; above all, when they have been thieves. To overcome these prejudices is one of the great duties which the aid societies impose upon themselves; and they have been to a great degree successful, particularly in Munich.

A month or six weeks before their liberation it is quite common for prisoners to write to the director of the prison a letter asking him to address in their favor a communication to the committee of such or such an aid society. In communicating such a request to a society, the director at the same time gives it all desirable information touching the conduct of the prisoner during the whole term of his imprisonment; on his occupation in prison; on the change which his treatment has effected in him, if any; or whether he has remained incorrigible. This petition is submitted to the decision of the committee at the first session after its reception. But, as the committee is composed of the most respectable citizens of the locality, men thoughtful and prudent, they are unable, ordinarily, to come to a definitive decision at their first meeting, especially as they are often ignorant of the social status of the prisoner and of his family. In cases where the committee desire to have more ample information, it charges one of its members with the special duty

of procuring it. Each petition is registered, with a summary of all the information afforded in it.

That feature in the constitution of the Bavarian aid societies by which a special guardian or protector is assigned to each liberated prisoner who becomes their ward, with the duties already described, is particularly worthy of notice. It is beyond all praise.

I have already mentioned my presence at one of the sessions of the patronage society of Munich. A copy of the minutes of that session was kindly furnished me through my friend Mr. Petersen. As it can hardly fail to have interest for those who occupy themselves with penitentiary questions, and especially for the members of prison societies, I append a translation, despite a complimentary sentence or two of a personal character.

Minutes of the session of 12th August, 1872.

President, Superior Commissioner Peekert.

Mr. Petersen, prefect, presents Dr. Wines, of New York, president of the International Penitentiary Congress of London.

The president thinks it an occasion of congratulation to be favored with the presence of a gentleman who has displayed an activity so great and so fruitful in useful results in respect of prison reform, and through whose agency the time cannot be far distant when the friends of our work, on both sides of the ocean, will lend to each other a mutual support by the intercommunication of their respective experiences.

Dr. Wines returns thanks for the honor done him, and says that his visit to Bavaria is mainly for the purpose of studying the organization of patronage in this kingdom, and making personal observation of its workings.

After the reading of the minutes of the session of the 5th August, the president remarks that Joseph Tamper, who is mentioned in them, is, in the opinion of medical men, too sick to remain under the care of the society. Thereupon, he is remitted to the charge of the philanthropic society.

Several directors of prisons announce, by letter, the approaching liberation of: 1. John Münch, potter, a workman in the manufactory of Rebendorf. After having been admitted, Mr. Auracher, member of the committee, is designated as his guardian. 2. Catherine Müller, single woman and laundress, aged twenty-four years, a prisoner at Wasserbourg and a native of Au, has the best of certificates. Accordingly she is admitted, and Mr. Fr. Barthelmes, her future guardian, promises to procure her work. 3. Mary Huber, aged twenty years, a prisoner at St. Georges, is admitted; and Mr. Ravizza is named as her guardian, in case she should need the aid of the association. 4, 5, and 6. Anna Mantel, petty thief; John Kappeller, an unmitigated gambler; and John Frey, an incorrigible vagrant, are not admitted because of their antecedents.

Louis Felser, printer, a ward of the society, asks sufficient money to defray the expense of his registry, made necessary by his approaching marriage. Several members favored the granting of this request; others opposed it. After a number of speeches, it is resolved that, before coming to a definitive decision, information be obtained regarding the character and antecedents of the betrothed.

Mr. Brucktraw, a resigned member of the society, is again received as an active member, and pays 4 florins 30 kreutzers as a subscription.

Richland, a ward of the society, having conducted himself in an exemplary manner as miller's boy at Bamberg, is voted 18 florins traveling-money.

Ward Delmoro, to enable him to take a situation offered, receives two shirts, three aprons, two robes, and one blouse from the wardrobe of the society.

The Treasurer Kinlner will have for substitute, during the time of his vacation, Mr. Comptroller Baierlacher.

After the reading of the present minutes the president invites our honored visitor to kindly affix his signature as a souvenir of his presence among us.

E. C. WINES, Secretary of the National Prison Association of the United States.

PEEKERT, *President.*

GAMPERT, *Secretary.*

CHAPTER XXXIV.

PERSONAL INSPECTION OF PRISONS IN ITALY.

§ 1. *The prison Delle Marate.*—In company with my friend Mr. Beltrani-Scalia, the very intelligent, able, earnest (the better word would be enthusiastic) inspector-general of prisons in the kingdom of Italy, I paid a flying visit to the only prison in Florence, named as above. It was only a glance that could be given to it, and it is but the briefest word that can be said of it. It is not a convict prison, but may be described, not inaccurately perhaps, as a detention prison and house of correction combined. It is on the Auburn system—association in common workshops by day, and complete separation by night. It has five hundred cells, and the number of inmates, September 22, 1871, was 376, of whom thirty were women. These latter are really in a distinct prison, for it is separated from the men's prison by a public street. Two beautiful little girls I saw in this part of the establishment—bright as new-coined eagles—the children of convict women. My heart was pained and oppressed by the thought of how much that is vile and corrupting they must necessarily see and hear and learn there.

The prison Delle Marate, though not a model, has good points. Labor seemed well organized, and among the industries, I noticed, was printing, which is one of the very best for prison inmates. Here was printed Mr. Beltrani-Scalia's *Review of Penitentiary Science*, a monthly journal of much spirit and ability, which is doing admirable service in Italy, and, to some extent, throughout Europe, in the work of prison reform. But this is a digression. The department of the prison that most gratified me was the school, which was attended by a hundred or more of the younger prisoners (in whose case, up to thirty-five, I think, attendance is obligatory) and as many of the older ones as chose. It is taught by the two chaplains, who give their whole time to religious and scholastic instruction. A very remarkable case of progress was brought to my notice, that of a lad who had been an inmate of the prison for only a month. At the time of entrance he did not know a letter of the alphabet; yet I heard him read, quite fluently, a page in a book as difficult, I should suppose, as what we call the *Second Reader* usually is. It is the most remarkable instance of rapid acquisition that ever came within my knowledge.

§ 2. *The prisons of Rome.*—There are four prisons in this city, including one for juvenile offenders. Two of these only did I visit, being accompanied on my inspection by Mr. Cardon, supreme director, and by Mr. Beltrani-Scalia, inspector-general, of prisons.

(a.) *The prison Delle Terme.*—This establishment is accommodated in a vast building, which was formerly a public granary, but has been altered to adapt it to the uses of a prison, and has been used as such for fifty years. As might be supposed, it is but ill-suited to the purpose, and is, in many ways, very inconvenient. There were four hundred prisoners, about forty of whom were women. Both sexes sleep in common dormitories, no doubt to their further contamination. The only industry practised by the men is weaving, at which the utmost they could earn was five or six cents a day. The women worked at lace-making, by which they earned four or five times as much as the men.

(b.) *The prison of San Michele.*—This prison is historic. Howard visited it nearly a hundred years ago, but it had a history before, most interesting and instructive. Howard found over the door of San Michele

this inscription: "Clemens XI, Pont. Max., perditis adolescentibus corrigendis instituendisque, ut qui inertes oberant, instructi, reipublicæ serviant. An. Sal. MDCCIV, Pon. IV." In English: Clement XI, Supreme Pontiff, [reared this prison] for the reformation and education of criminal youths, to the end that those who, when idle, were hurtful to the state, might, when better taught and trained, become useful to it. In the year of our Lord, 1704; of the Pontiff, the 4th. Within the prison, high up on a marble slab, inserted in the wall of the principal apartment, he found this—as he rightly says—"admirable sentence:" "Parum est improbos coercere pœnâ, nisi bonos efficias disciplinâ." In English: It is of no use to restrain criminals by punishment, unless you reform them by discipline. In this sentence Howard found, as all right-thinking men must find, the true aim of all just prison treatment. In the center of the room was hung up the inscription, "Silentium." So that, as would appear, the silent system of associated labor, combined with a reformatory discipline, was inaugurated at Rome in the very beginning of the eighteenth century, that is, one hundred and sixty-nine years ago. One of the main agencies relied on to effect the desired reform of the prisoners was industrial labor and the training of them to the knowledge of a trade. Various handicrafts were taught and practised in the establishment, such as printing, book-binding, designing, smithery, carpentry, tailoring, shoemaking, weaving, dyeing, and the like. Surely Pope Clement XI must be allowed a place among the most enlightened rulers and reformers that adorn the annals of our race. On some points, the world might still go to school to him with advantage. That such a doctrine should have been taught and such a practice maintained in the seat of the Papacy at a time when chains, dungeons, and tortures were almost the only forms of public punishment in the rest of the world, is a marvel. Let honor be given where it is due.

At the present time the prison appears to be of rather a mongrel sort—half cellular, half congregate. I found some four hundred prisoners there, some of whom were working in cells, and others in common shops.

§ 3. *The future of penitentiary reform in Italy.*—While engaged, in 1871, in my mission of organizing the congress of London, it was impossible to devote much time or to go at all out of a direct line from one capital to another (my business being chiefly with governments) to examine prisons. I went to nearly all that fell in my way, but to scarcely any that would require any divergence to reach them. For this reason I had no opportunity of seeing any of the more recently-constructed and better-organized prisons of Italy, of which the number is considerable. Still, I left Italy, after a very brief sojourn, (for the business of my mission was completed within twelve hours after my arrival,) with the best impressions and the best hopes for her future, in so far as the great interest of prison reform is concerned. Mr. Lanza, prime minister, and at the same time minister of the interior, who, in virtue of this latter office, is head of the prison administration; Mr. Cardon, director; and Inspector Beltrani, (I had not the honor of becoming personally acquainted with the other inspector,) are gentlemen of great ability, large views, and an earnest devotion to this work; and they are nobly seconded in it by a royal commission, composed of eminent citizens, having special knowledge of the subject, and appointed expressly with a view to making a broad study of the penitentiary question, and proposing such reforms in the criminal code, the criminal laws, and the criminal administration of the country as, after such

study, they might judge desirable and expedient. On these grounds it is not too much to hope that at no distant day Italy will become a leader whom it will be safe to follow in whatever relates to the organization and conduct of prisons, an interest which is beginning to claim its just place in human esteem, and to command the attention which is due to its magnitude and its importance.

CHAPTER XXXV.

PERSONAL INSPECTION OF PRISONS AND REFORMATORIES IN BELGIUM.

§ 1. *Belgian prisons.*—Of these I inspected but three—the central prisons of Louvain and Ghent, and the city prison at the latter of these places.

(a) *The prison of Louvain.*—This is the model cellular prison of Europe and the world. I paid two visits to it—one in 1871 and the other in 1872, with an admiration which no words could exaggerate. Its design, construction, and administration, for a prison of its class and on the cellular plan, seemed to me to leave absolutely nothing to be desired. More than a year ago, at a public meeting in New York, I said, of this prison:

I cannot close without a word of reference to the prisons of Belgium, which John Howard, a century ago, found worthy of praise. At present, however, I can only call your attention, for a moment, to the new model prison of Louvain, planned and built under the superintendence of M. Stevens, its director for ten years, but now inspector-general of prisons for Belgium, and a worthy successor in that office to the illustrious Duepetiaux. The building itself, which is large enough to accommodate five hundred inmates, is of brick, with marble facings. It is simple, solid, and severe in its beauty, with nothing of that palatial look which is so common in our great prisons, and which has always seemed to me wholly out of place in buildings devoted to the treatment of criminals. But it is the *inner* “glory that excelleth.” I had never conceived of anything, in the form of a penitentiary establishment, so admirable in organization, so perfect in administration. Nothing seems to have been forgotten in its construction, nothing overlooked in its rules, nothing omitted in the details of its arrangements. The system of imprisonment is that known as cellular, of which, *per se*, I am not a supporter; but the cellular system is here applied in a manner quite different from what I have seen it elsewhere. Each prisoner receives not less, on an average, than five or six visits a day, from chaplain, schoolmaster, director, trade instructor, or other officials, by whose presence and converse the burden of solitude is lightened and made tolerable, and by whose counsels, motives and encouragements to a better life are suggested and pressed upon the prisoner. The whole aim appeared to me to be the reformation of the criminal; to that all efforts appeared to be directed; and the results are as extraordinary as they are encouraging. The prison has been in operation about twelve years. The recommitments to the old prison of Louvain averaged 70 per cent.; at present they are only 6 per cent. This proves not only that criminals may be reformed, but that their reformation depends less on organization and system than on the spirit of the administration and the men who conduct it. “Where there is a *will* there is a *way*,” is a maxim which seems as true of the intent to change bad men into good ones, as of any other human undertaking.

Of the above account, written after my first visit, I do not retract a word since the second. I will say no more of the prison, (though much might be said if one could enter into details,) but must add a word in regard to its founder and first director, Mr. Stevens. He kindly accompanied me on my visit to Louvain, and directed that every possible facility should be afforded me for observation; an order which was obeyed to the fullest extent, though, from motives of delicacy, he abstained from making the round of the penitentiary with me. His heart is evidently

still at Louvain, and indeed it is no less manifestly, in its every pulsation, wholly and most intelligently, in this work of prison reform. I am sure he pursues it in his dreams, and to it his waking hours, "from morn to dewy eve," and even till night is far advanced in her dusky course, are given with all the freshness and ardor of a virgin love.

The present director appeared to be able and efficient, not unworthy to have succeeded so distinguished a man as Mr. Stevens.

(b) *Convict prison of Ghent, (maison de force.)*—It is just a hundred years since this prison was founded. It owes its existence to the genius and humanity of the Viscount de Vilain, a truly great man, who, in his conception of the nature, object, and processes of a true prison discipline, was fully a hundred years in advance of his cotemporaries. His prison was founded upon the idea of preventing crime by combating idleness, and of maintaining discipline by moral power instead of brute force; a grand conception, to whose perfect realization the world is even now slowly and laboriously working its way. Early in his vast and tireless visitations of prisons, Howard came to Ghent, where he found the prison fully organized under the guidance of its illustrious founder, with its numerous industries in active operation, with its admirable discipline maintained almost wholly by moral forces, with its incomparable order and cleanliness, the whole a hive of busy industry, by which nearly all its expenses were paid, and, altogether, the very antipodes of the English prisons, from whose inspection he had just come; it may well be supposed that his eye was delighted and his heart rejoiced. But more than this, his ideas were enlarged, and his purpose and courage strengthened; indeed, his whole being received a new and mighty impulse toward his life-work. Howard was a different man from what he would have been but for the prison of Ghent, and it is not too much to say that he was, in some sense and to a certain degree, himself the creation of the great and good Viscount de Vilain.

The prison of Ghent is of large dimensions, containing accommodations for a thousand prisoners. It is on the radiating plan, having eight wings, five of which were already built in Howard's time, and they remain to-day substantially as they were then. It is conducted, in the main, on the Auburn system, though it is partly also cellular, one wing being devoted to the treatment of prisoners on that principle. It was here, indeed, that the system which has become so widely known as the Auburnian had its origin; or rather, as I conceive, it was first practised in Rome, and was the conception of Pope Clement XI.

The director struck me as being an able, energetic man, of great administrative ability; and, withal, he is certainly a warm partisan of the Auburn as against the Pennsylvania system.

(c) *Detention prison and house of correction at Ghent, (maison de sureté.)*—On my second visit to Belgium I made a hurried inspection of the establishment named above just as the day was fading into night. It is a large, commodious, well-kept cellular prison, designed for two classes of prisoners of both sexes: 1. Persons arrested and awaiting trial. 2. Persons sentenced to short terms of imprisonment.

§ 2. *Juvenile reformatories.*—I visited but one of these, that at Ruysselede, near Ostend, which, however, is divided into three different departments, in three different localities, and forming, in effect, three distinct schools of reform—two male and one female—though all under the same head. The two for boys are at Ruysselede and Wynghene, within sight of each other; that for girls is at Beernem, two or three miles distant. I could wish that more time and space were at my command for a description of this establishment, for it well deserves the

amplest treatment. With the solitary exception of Mr. Demetz's agricultural colony at Mettray, it exceeds all others visited abroad, both in its management and its results; and in one particular, (to be hereafter mentioned,) it has the pre-eminence over Mettray and all other juvenile reformatories known to me in any part of the world.

Ruyssede is the work of Ducpetiaux, perhaps his master achievement; but he was ably seconded by a man of rare powers and aptitudes for the task, Mr. Poll, who was its first director, presiding over it from the day of his appointment, in 1849, to that of his death, in 1867, a period of eighteen years.

The present director, Mr. Eugene Poll, is a son of the late incumbent, whom he succeeded immediately on the decease of the latter. I was accompanied on this inspection by the Rev. Joshua Coit, secretary of the board of prison commissioners of Massachusetts. Though we had not the advantage of any official or even private introduction, the director received us, not simply courteously, but with the utmost cordiality. He conducted us through every department of the establishment at Ruyssede, giving full explanations of all its parts and arrangements, and answering all questions with perfect frankness.

The class of boys treated here are not criminals, properly so called; but they are such as are in danger of becoming so—vagrants, truants, street beggars, and the like. The whole number received from the beginning is about 5,000. The day we were there the number was 522, of whom only two were in hospital, and one of them from a broken arm—a clear indication of the sanitary state of the school, and of the good care that is taken of the inmates.

The institution is conducted on the congregate plan. The boys sleep in large dormitories, admirably arranged—as, indeed, every part of the establishment is—and kept in the cleanest possible condition.

The labor is principally farm-work. The farm consists of two hundred and forty acres, nearly all under tillage. The kitchen garden contains nineteen acres; but, indeed, a great part of the land seemed cultivated like a garden. The outbuildings and nearly all the accessories are arranged and kept in the best manner. In short, this may be pronounced in all respects a model farm. The stock consisted of 18 horses, 114 cows, 7 bulls, 150 sheep, 70 large hogs, 80 pigs—all in the finest order.

While the work is, as already stated, principally expended on the farm, there is also, particularly in winter, much mechanical labor, which is distributed through a considerable variety of trades, such as carpentry, smithery, painting, varnishing, shoemaking, knitting, tailoring, spinning, weaving, straw-plaiting, &c. Very few purchases, comparatively, are made for the establishment from the outer world, almost everything required for consumption, outside or inside the body, even to the manufacture of the beer, which is there deemed a necessity, being produced and worked up on the premises. Thus, for example, the wool and flax needed for clothing is grown on the farm, and the boys spin, weave, and work it up into garments. The straw (so much as may be necessary) is plaited and made into hats. The hides are converted into leather and manufactured into shoes. Stockings are knit from the wool clipped from their own sheep, for winter use, none being required for the summer. And so on to the end of the catalogue.

This extraordinary thrift, as our New England people would call it, is the cause of the existence of a fact which, so far as known to me, is wholly unparalleled elsewhere in the history of reformatory institutions. Reference is here made to the fact that the reform school of Ruyssede not only pays all expenses, including those of the administration, but

actually realizes a net profit every year of some thousands of francs. In 1874 the gain was 3,000 francs; four years previously it was 10,000. This result is the more remarkable inasmuch as a considerable number of the boys are too young to do much toward earning their support, and conscientious attention is given to the scholastic instruction of all.

The ages of admission are from seven to eighteen; in exceptional cases, boys younger than seven are received. The term of committal is during minority. The average stay in the institution is about three years. Some, however, remain only three months, others from eight to ten years.

Mr. Poll claims that, substantially, all the children sent to Ruysselede are saved. The number who turn out badly is brought down to within a fraction of zero.

The school at Wynghene has some fifty boys who have chosen for their calling a sea-faring life. Here, in a little lake, is a full-rigged ship, in which they are daily drilled in all nautical maneuvers and terminology. There are also, in a large apartment of the house set apart for the purpose, numerous models of vessels and craft of all sorts, with complete rigging, loaned by the museum at Brussels, to be used for the professional instruction of the young sailors.

For the rest, beyond the time devoted to this technical training, the boys in this department occupy themselves precisely as those do in that of Ruysselede—working on the same farm, but in shops at their own place.

Our next visit was to the girls' reform school at Beernem. This is conducted by a religious sisterhood, with a lady superior at its head, though it is under the general superintendence of Mr. Poll. There were two hundred and fifty inmates at the date of our inspection. We found it in no respect inferior to Ruysselede. The sister-in-chief is quick, sharp, accomplished, and energetic in a remarkable degree. I said to her: "Sister, I was surprised to learn that the boys at Ruysselede earn their full support. I presume that this is not done by the girls?" Very promptly she replied, and in a tone and manner indicating some little feeling: "The girls gain more than the boys; their earnings amount to 100,000 francs a year." They are chiefly employed in lace-making, sewing, and laundry work.

With a sufficient number of such establishments as those at Ruysselede, Wynghene, and Beernem established in all countries, the problem of the prevention of crime will be far on its way toward a satisfactory solution. How much *cheaper*, as well as better, would it be to save the vicious children than to punish them as criminal adults!

CHAPTER XXXVI.

PERSONAL INSPECTION OF PRISONS AND REFORMATORIES IN HOLLAND.

§ 1. *Military prison of Leyden.*—This prison is not for soldiers who have committed offenses merely against military discipline, but for such as have been found guilty of acts which brought them within the purview of the criminal laws of the land. The prison is a substantial structure, very plain, surrounding an open quadrangle, which serves as an exercise-yard for the prisoners, who, in companies of forty to fifty,

spend an hour there every day. On one side of the hollow square is a building containing the offices, on another is the large dormitory building, and on the two others are the shops, store-houses, school-rooms, &c. There are eight large halls for dormitories, with very lofty ceilings, each having forty-eight small compartments or cells, in all three hundred and eighty-four, every one of which had an occupant on the day of my inspection, with an overplus of four prisoners. The arrangement of the cells is unique, and it struck me as excellent. They form a double row of iron boxes extending the entire length of the hall, with an encircling corridor not less than ten feet in width. The ceiling is at least twice as high as the sleeping-rooms, an arrangement facilitating the supply of pure air. The circulation of the air is further aided by the perforation of the iron which forms the front and top of the cells. Around the entire wall runs a water-trough for purposes of ablution, each prisoner being furnished with a wash-basin of his own. His towel hangs in his cell at the head of his bed, which latter is of straw, on an iron bedstead. There are but few articles of furniture in the cells, as the prisoners take their meals in the workshops.

Among the industries pursued are shoemaking, rope-making, tailoring, carpentry, smithery, painting, &c. The prisoners are allowed half of what they earn, and of this a moiety may be spent in the purchase of additional food and other comforts during their captivity, the other moiety being kept as a *masse de réserve*, to be paid to them on their discharge. The proceeds of the one-half of the labor, which goes into the chest, suffices to defray all current expenses, except the pay of the staff, who, being all officers of the army, receive their salaries in the same way and from the same fund as other military officers.

Every prisoner, if he did not know one before, is taught a full trade, whenever his sentence is long enough for the purpose, which is by no means always the case, as the sentences run from two months to twenty years.

The proportion of prisoners wholly illiterate on entrance is 10 per cent.; most of the remaining ninety have a fair common education. Nevertheless, the whole body of the prisoners are required to attend school two hours every day. Three schoolmasters are employed, who devote each six hours a day to the work of instruction, and in this they are further aided by twelve convict assistants. All the branches of primary and more advanced common-school education are taught, to which are added, in the case of all prisoners desiring it, French, English, and drawing, particularly linear or mathematical drawing. A large room is appropriated to this last-named department.

Except in the hospital, which was exceedingly neat and cosy, the prison presented a rather slovenly appearance, and could not be commended as particularly clean. Still, it has merits, and in some points might be advantageously copied elsewhere.

§ 2. *The cellular prison of Amsterdam.*—I visited this prison in company with Mr. Ploos van Amstel, secretary of the prison board, on a Sunday morning, at the hour of divine service, and heard, in low Dutch, what I presume, from its animated and graceful delivery, to have been a very eloquent sermon; I say from the manner of its delivery this was my surmise, for I could not judge from its effect on the audience, as every man of them was in his cell, and, to all appearance, with the exception of a few keepers, Mr. Ploos van Amstel, and myself, the orator appeared to be addressing himself to empty space.

After the service, we inspected the cells and other parts of the prison, all of which were found in a state of order and cleanliness that

left nothing to be desired. It is a misdemeanants' prison, where sentences range from a few days to two years. It has but two hundred cells, of which, at the date of my visit, one hundred and sixty had occupants; forty of these were women, who were accommodated in a ward entirely separated from the part of the prison in which the men are confined.

The industries are brush-making, tailoring, carpentry, smithery, &c. The state only receives three-tenths of the earnings; the other seven-tenths belong to the prisoners. Four of the prisoners' tenths are kept by the administration as a *masse de réserve* against the day of liberation; the other three are at their disposal to send to their families, if they have any, or to spend in adding to the comforts of their prison life.

With rare exceptions, the inmates can read and write when committed; still, two schoolmasters are employed to give lessons in the cells, and thus to supplement by added acquisitions the education previously possessed.

§ 3. *Detention prison at the Hague.*—Accompanied, or rather conducted, by Mr. M. S. Pols, who had been a government delegate to the London Congress, I paid a short visit to the congregate prison, in which are confined prisoners awaiting trial and those sentenced to short imprisonments. It is an old structure, built more than three hundred years ago, and seems chiefly distinguished for two qualities—massiveness and irregularity. As far as what is material was concerned, the prison is well kept, and everything was clean as soap, water, brush, and muscle could make it. But all praise must stop at this point. Prisoners to the number of one hundred and fifty were congregated there, doing almost nothing but corrupt each other by day, and at night sleeping in common dormitories, without supervision, to continue the same business with increased vigor. Few have trades when they come, and fewer still, even of the sentenced, remain long enough to learn them. There is here an ample margin for reform.

§ 4. *Patronage.*—The work of aiding liberated prisoners is well organized in Holland, is conducted in an energetic manner, and is attended with fair success. There is a central organization, with its seat at Amsterdam, called the Netherlands Society for Ameliorating the Moral Condition of Prisoners, which has forty branches scattered throughout all parts of the country, and corresponding members in thirty-seven localities where there are no branches. The great aim of all these associations, here as elsewhere, is to save the discharged prisoner from a relapse; but to this end the work of patronage is begun in the prisons themselves. In Amsterdam, and wherever branches of the central society exist, the members are permitted and are accustomed to often visit the prisoners confined in the jails of the kingdom, with a view to guide and influence them to good. Many of the societies have committees of ladies attached, who are active in this work, and whose labors are most acceptable and useful. When I had the honor to call upon the president of the parent society at Amsterdam, the venerable William H. Suringar, then over eighty years old, he showed me a thick folio volume, filled with closely-written manuscript from cover to cover, and containing the record of his personal visits to prisoners or their visits to him, in which are set down the main facts in each case. I cannot state the number of cases in that rare book, but am sure that it runs up into the thousands.

§ 5. *The Netherlands Mettray.*—This is one of the model reformatories of Europe, and is situated at Arnheim, near Zutphen, distant five hours by rail from Amsterdam. It is on an estate named Rijsselt, formerly

the seat of a nobleman; now an agricultural reformatory colony, founded twenty years ago by Mr. Suringar, mentioned in the preceding section, and designed for vagrant and vicious boys, not yet criminal, but in imminent peril of falling. It is a close imitation of the French Mettray, and is conducted on the strict family principle. There are ten houses for boys, each capable of accommodating fifteen. They are arranged on the two sides of a parallelogram, (five each side,) with the residence of the director at one end of the quadrangle, and the beautiful little church of the colony at the other. In the rear of the director's residence are the workshops, school-house, &c. On either side of the quadrangle, but at considerable distance from the other buildings, are the picturesque residences of the sub-director and schoolmaster. A large and substantial farm-house, with all needful out-buildings, near but outside the main entrance, completes the *tout-ensemble* of edifices belonging to the establishment. The spacious square itself, around which all these structures cluster, has the appearance of an elegant garden, in the center of which is a charming flower-plot. The effect, to an observer on passing the iron gate which forms the chief entrance to the colony, is very pleasing, the *coup d'œil* offering to his view what at first strikes him as a miniature paradise.

I was the bearer of a letter of introduction from Mr. Suringar to Mr. Schlimmer, the director of the colony, who has served in that capacity from its origin, and has developed rare gifts and aptitudes for the place. The sub-director is a Mr. van Veen, who has occupied the post for only two years, during which time he has given indubitable proofs of special fitness for its duties. Mr. Schlimmer, knowing only German, committed me to the sub-director, who could speak French, and who conducted me through the establishment, explaining every part in the most satisfactory manner.

It has already been stated that the ten family houses are for fifteen boys each, and they were full, or nearly so, on the 7th of August, 1872. At the head of each household is placed a monitor, selected from among the larger boys, who acts as an under-officer during the day, and has sole charge of them at night. This system has been substituted for that of house-fathers—first, on economic grounds, and, second, because of the difficulty of finding suitable persons willing to serve the colony in that capacity. The interior of the family houses is simple and commodious, but they were not remarkable for cleanliness, and the establishment seemed to me to suffer sensibly from the lack of female care and influence. Each house has a dwelling-room, wash-room, and closet on the ground floor, and a dormitory above. The meals are prepared in a general kitchen, from which they are taken to the several houses, and each family breakfasts, dines, and sups by itself.

The labor is chiefly farm and garden work, sixty-four acres constituting the farm. There is a kitchen garden of eight acres, and a smaller garden for fruits and flowers, with nursery, hot-beds, and conservatory, where the boys are taught and trained in all the mysteries of both the ruder and finer kinds of gardening. A considerable income is derived from the sale of flowers, as well in pots as bouquets, and also from that of fruits, large and small. The occupations of the colony, additional to farming and gardening, are shoe-making, tailoring, carpentry, cabinet-making, smithery, painting, varnishing, baking, and, I think, a few others. As far as possible—and it is found possible in most cases—the boys are permitted to choose the calling they will follow. There is even a normal school and a military school in the establishment, where those whose tastes incline them to teaching or military life acquire the techni-

cal knowledge and training required for those professions. I was curious to know how many schoolmasters had been graduated from this seminary. The sub-director was unable to give the aggregate, but said that eight had gone out to be teachers during his two years' incumbency. One of these was on a visit to his former home when I was at Rijsselt. He was a stout, manly-looking youth, and seemed greatly to enjoy this renewal of intercourse with his late comrades. He reported himself as "doing well," and as satisfied with his place and prospects.

Only boys over nine and under fourteen are received; on an average, they remain two years at the colony; and their services, on discharge, are much sought after. Not more than two per cent., according to the best evidence—so Mr. van Veen stated—ever become criminals. Most of them would no doubt have followed a life of crime but for their training here. How noble and—let us not forget to say to people who do not love taxes—how cheap a charity this is, clearly appears from the fact that seven hundred and twenty boys have been admitted to its benefits, and five hundred and seventy-one have gone forth from it, to add to the productive industry of the state, instead of being spoliators and destroyers of its wealth, and no less so of its virtue.

The appearance and demeanor of these lads impressed me most favorably. One never would have guessed that they had been little Arabs of the street. Except a few low and repulsive faces, the whole company appeared well-mannered, cheerful, respectable youths. Their manly bearing and quiet, orderly movements showed the care bestowed on their bodily training, and, by what I was told, their moral training bears a fair proportion to the physical. A profane or vulgar word (so I was assured) is seldom heard, even when the boys are by themselves. The officers have succeeded in forming a right public opinion among their *élèves*, which acts with great force, and, as a consequence, have created an *esprit de corps* which finds expression in such phrases as "We are the boys of Netherlands Mettray! We respect ourselves, and mean that others shall respect us."

All the boys are well instructed in the several branches of a common-school education, and special attention is given to music. An hour is devoted daily to this branch by the whole school, not all at the same time, but in groups, according to their advancement. I was present at a class-exercise of this kind and observed how thorough and even scientific was the instruction given, and how intense the interest and delight of the boys in their work.

Every Sunday, in the morning, the boys attend service in the parish church of the neighboring village; in the afternoon at the church in the colony. Other parts of the day, deducting what is given to suitable recreations and rest, are devoted to sacred song and various religious exercises. From 7 to 7.30 on each morning of the week-days a service of prayer is held in the church, which is conducted in turn by the director, sub-director, and schoolmaster, who reads a chapter and accompanies the reading with such comments as he sees fit, and all unite in singing a hymn, while one of the boys plays the organ.

As a means of moral education much stress is laid on what is called the "sentence system." It has long since been observed that a pithy saying, a proverb, a fable, even a single word that infolds a pregnant meaning, often produces a happy and lasting effect upon the young mind. Charles Dickens, when on a visit to a reformatory in Massachusetts, being called upon for an address, said simply: "Boys, do all the good you can, and make no fuss about it." That curt, crisp sentence was better for the boys than would have been an hour of silver-tongued

rhetoric. So the conductors of the Netherlands mettray have thought it good and helpful to make much use of such sentences as these, (sometimes hanging them on the walls, sometimes giving them out to be learned by heart:) "He who seeks himself will not find God." "A poor man he, who has nothing but money." "He is a fool who lives poor to die rich." "Labor has a golden bottom." "Care for the moments, and these will care for the years."

Whenever anything extraordinary takes place in a family, or when a boy makes himself notorious by his bad behavior, a sentence is applied. Thus, on the occasion of the death of one of the parents of a boy, a consoling text or sentence is suspended on the wall of his dormitory. One day a boy was overheard using foul speech to a comrade. The sentence, "It is better to be dumb than to use the tongue for filthy talk," was given to him, which he had to read to the company every morning for eight days. It had the desired effect.

In a corner of the colony farm there is a secluded and beautiful little cemetery, where are interred the remains of twenty-three *colons*. At the head of each grave is placed a little painted board, with the name, age, &c., of the lad who sleeps beneath, and the mound surmounting the grave is planted with flowers. Near the center of the cemetery stands a large, spreading tree, with its thick branches drooping to the earth, beneath which the remains of Mr. Suringar were to be interred. Already, while I pen these sentences, in less than six months from the time of my visit, the good man who founded this noble institution sleeps peacefully in his last, self-chosen resting-place. "The memory of the just is blessed." That of William H. Suringar will be green and fresh in many a heart as long as the Netherlands Mettray continues its benign and beautiful work.

CHAPTER XXXVII.

PERSONAL INSPECTION OF PRISONS AND REFORMATORIES IN FRANCE.

§ 1. There are two distinct prison administrations in France—the prefecture of police and the ministry of the interior. The former has charge of the prisons of the department of the Seine, the latter of all the other penal establishments of France. Their jurisdictions and all their movements are as independent of each other as if they were on the two opposite sides of the English Channel. Mr. Lacourt is chief of the division of prisons for the department of the Seine, Paris; and Mr. Jaillant, under the minister, of the division of prisons for the rest of France. I called upon both these gentlemen, and had a long interview with each, with a twofold aim—first, to gain information, and, secondly, to obtain the necessary authorizations to inspect the prisons within their respective jurisdictions. *Tout le monde* had spoken to me of Mr. Jaillant as a person of rare qualities and worth, and I found *tout le monde* quite right in its estimate. I was profoundly impressed with the breadth of his intellect, the largeness of his heart, and his thorough devotion to the cause of prison reform; and the same impression was made upon me by his chief of bureau, Mr. Jules de Lamarque. Mr. Lacourt is also a noble specimen of humanity, a man of large intelligence and broad sympathies, and, like Mr. Jaillant, "well reported of" by his fellow-citizens. Mr. Jaillant kindly furnished me with a permit to visit prisons out of Paris, and Mr. Lacourt to inspect those within that city. His author-

ization, which I give as a matter of curiosity, is in these words: "The directors of prisons in the department of the Seine are authorized to admit into those establishments Mr. Wines, who has been delegated by the American Government to organize an international prison reform congress, together with any friends who may accompany him, and to afford him all the information he may desire. Mr. Wines is recommended in a very particular manner to the courtesies of the directors."

I inspected all the prisons of Paris; two central prisons, one male, the other female; and two (outside of the capital) for the detention of persons awaiting trial, and for prisoners convicted and sentenced for minor offenses.

There are eight prisons in the city, viz: 1. The Grand-Dépôt of the Prefecture of Police; the Conciergerie; Mazas; Sainte-Pélagie; Saint-Lazare; La Santé; the Grande-Roquette; and the Petite-Roquette.

§ 2. Before proceeding to any description of these establishments, however brief, it seems proper, if not necessary, to give explanations of a few terms employed in the French criminal nomenclature, which, before going abroad, had troubled me not a little for the reason that I was unable to comprehend exactly what they meant. I refer to the words *inculpés*, *prévenus*, and *accusés*. The equivalents of these words in English all designate persons charged with some offense; but the exact distinction is difficult for us to grasp. Indeed, they convey to us no distinct meanings, because there is nothing in our judicial processes to correspond to them. The *inculpés*, then, are persons who, having been arrested either on a warrant or *flagrante delicto*, (in the act of committing a crime,) are conveyed, prior to a hearing, to some prison for safe-keeping until their examination takes place. The *prévenus* and the *détenus* are *inculpés*, who have had their first hearing, and have been ordered by the committing magistrate (*juge d'instruction*) to be held for trial. But there is a difference between them. The *détenus* are prisoners held for trial on a charge of misdemeanor, (*délit*;) the *accusés* are prisoners held for trial on a charge of felony, (*crime*.) The two classes are taken before different courts for trial—the *détenus* before the tribunal of correctional justice, where the trial is by the judges alone; the *accusés* before the court of assizes, where they are tried by a jury. The account to be given of the prisons of Paris will be more intelligible for these short explanations.

§ 3. *The Grand-Dépôt of the Préfecture of Police*.—This is a prison for persons who have been arrested by the police, but have not yet had their hearing before a committing magistrate, (*inculpés*.) It is a vast pile in one of the courts of the prefecture, with a capacity for 1,200 to 1,500 prisoners; but into it, I was told, are sometimes crowded 2,000. I may remark, just here, that the committal and discharge of prisoners, not only here but everywhere in France, are made with perfect regularity. In every prison the director or keeper must have one or more registers, signed on each page by the prefect or some magistrate. These registers record the act of delivery of each prisoner, and, on the margin, the date of his discharge, as also a copy of the decree, arrest, or judgment, in virtue of which it has place. It is thus easy to be sure of the legality of every imprisonment.

The legal time of detention in the Grand-Dépôt is twenty-four hours; but such is the accumulation of business and such the pressure upon the time of the magistrates charged with the preliminary examinations, that prisoners are often detained here a week or more. In the male department there are some fifty separate cells for the better class of prisoners, and a somewhat less number in the female wards, whose inmates, I

was glad to observe, were altogether under the care of women. But the mass—and a seething mass it was of corrupt and corrupting humanity—were thrown pell-mell together. If the problem had been to create a sort of cosmopolitan exchange, where the most dangerous villains, drawn to Paris from all quarters, could meet, become acquainted with each other, and lay plans for future crimes, the intent could not have been better carried out. A hundred desperadoes, or more, are there to be seen in a single vast apartment—the scum of all crafts, the shame and terror of the city. The flow inward and outward is without interruption. The coming and going never cease. The movement is like that of a shuttle, that incessantly shoots from side to side of the growing texture. Indolent, suspicious, cunning, lovers of darkness because of the villanies that are sheltered by it, they are little to be feared when separated from each other. But here they are brought together by the law itself; they are kept in absolute idleness for days, or even weeks; they become acquainted; they organize; they plan; they know where to meet on the first moment of liberty. The young thieves learn from the old ones. They are taught the *good strokes* to be made. They are instructed in the best modes of operating, from the picking of a pocket to the breaking into a house. They learn the whole theory of crime. They are told where to find the safest receivers and the worst haunts. And so the army of crime is recruited more steadily, as well as surely, than were the legions of Napoleon by the most relentless conscriptions. The children are, it is true, separated from the adults; but not from each other. On the contrary, they are confined in association, without supervision, in an adjoining apartment, where, it may readily be believed, the precociously wicked will exercise the greatest influence. I saw there, in one of the exercising-yards, a most piteous sight—some fifty boys or more, from seven years old to fifteen, all huddled together like sheep in a pen, some of whom, from the sobs and blood and angry tones and fresh-torn garments, had been engaged in a fearful fight. In the women's ward, also, there is the same promiscuous association; and, of course, the same effect of mutual contamination. The authorities aim to keep the lewd from the rest, but those most affected with this spirit, and therefore the most dangerous corrupters, are not always known to the police. Of what evils may not such contact be the cause?

§ 4. *Mazas*.—This prison is appropriated to the *prévenus*—that is to say, persons who have been placed by the examining and committing magistrates in the category of misdemeanants, and the trial of whose cases has been assigned to the tribunal of correctional justice. It is therefore a prison of preliminary detention mainly, though there are some prisoners here under sentence. It is a strictly cellular establishment, and may be said to be the gift of Pennsylvania to France. It is the chief fruit, or at least the most tangible, of the visit of de Beaumont and de Tocqueville to this country forty years ago. It belongs to the largest class of prisons, the number of cells being twelve hundred, and the mean population a little more than eleven hundred. I cannot undertake a complete description of this immense structure. Its exterior aspect is somber and gloomy to the last degree. Stretching its lofty walls of immense hewn stones on the side of the street opposite to the station of the railway of Lyons, it offers in its dismal appearance and its intense silence a striking contrast to the animation and bustle which surround it on all sides. The moment you are fairly within, the arrangement of the entire structure is apparent. The cellular system yields up its secret on the instant. A single glance tells the whole story.

There are six vast galleries, twelve and a half meters* high, three and a half wide, and eighty long. Six enormous passage ways, radiating from the rotunda, separate the wings from each other. It is majestic, certainly, but cold and saddening as well. A staff of seventy officers, under the director, consisting of a deputy, seven sub-deputies, and sixty-two overseers, here accomplish, day and night, a wearisome service; for it is unceasing. Clothed in a blue tunic, on whose collar shines a silver star, and whose buttons have in the center an open eye, (symbolic of eternal vigilance,) surrounded by the words *Prison de la Seine*, the overseer passes and repasses incessantly from end to end of the gallery intrusted to his custody. He looks through the little hole in the door of the cells, fitly named *judas*; he stops if he hears any unusual sound; he sees everything, without being seen himself; turning mechanically between his fingers the heavy key which opens all the doors, he glides rather than walks, and at night wears list slippers, that he may pass more quietly. For the most part, he is an old soldier, formed to habits of strict discipline, and familiar with all the severities of the camp. To look at him, one would say that he forms part of the prison itself. He is silent, like it; he never smiles, and if he speaks, it is ever in a low tone. In passing through a vast cellular establishment like Mazas, one feels, unavoidably, as if he were in a sick-chamber. 'Tis an instinctive sensation, and not groundless, for moral, like bodily, lesions often partake of the character of morbid affections. By living constantly in the midst of prisoners, the keeper comes to look upon them as he does on other people; he feels neither horror nor pity. He is polite and even gentle toward them, partly, perhaps, from a kind of indifference, but also because he is advised to such a conduct. But he is no less prudent than polite, and in retiring from a cell he always goes backward. He sees that the regulations relating to the prisoners, which are simple and easy to follow, are strictly carried out. At 5 o'clock in summer, and 6 in winter, the prisoners are rung up by a bell in the rotunda. At the end of a half hour each prisoner must have his hammock rolled up and attached to hooks in the wall, and his cell swept and put in order; the doors are then opened and the night-vessels removed; at the same time the water and bread for the day's consumption are distributed. At 8 the morning soup is passed into each cell in a porringer; at 3 the evening meal is distributed; at 8 the bell rings, and the prisoner arranges his hammock, and makes his bed. This is the locking up. At 10 every light is put out, unless a special authorization is accorded by the director, who, indeed, rarely refuses it when asked. During the day the prisoner works in his cell at some one of the industries carried on in the establishment—plaiting jute-mats, making list slippers, sewing copy-books for school-children, making buttons and small iron chains, tailoring, shoemaking, working at his own trade, &c. The number of days' work done at Mazas in a year is about a quarter of a million; the aggregate earnings not far from 100,000 francs; and the average earnings per man for each day of work 40 centimes, equal to 8 cents. The contractor is represented in the prison by a foreman from outside, who chooses, by designation of the director, a number of prisoners who, being more intelligent and attentive than the rest, are made chiefs of shops, wear on the sleeve a piece of red lace, communicate with their comrades in distributing work and giving directions concerning it, and thus enjoy a relative liberty, much desired and much envied. The least infraction of the rules

* A meter is 39 inches.

costs the man thus promoted his strip of lace, sends him back to the ranks of the prisoners, and again locks the door of his cell, which the necessities of his service had required to be left open the whole day.

Mazas is well guarded. The gratings are solid; every door and gate is kept firmly locked; the walls, of which, as in all French prisons, there are two, with a wide space between them, are thick and high; the overseers have their eyes wide open, and during the night sentinels are posted in the circling space between the two inclosures just mentioned. The element of power is ever in view here, and material force seems the chief reliance. And in one respect the success has been complete. Not a solitary escape has been effected in twenty-five years, and only one attempt to escape has ever been made.

§ 5. *The Conciergerie*.—This prison is destined to the reception of men and women to be tried by the court of assizes, (*les accusés*), and of sentenced prisoners who have appealed to that court against the judgment of a tribunal of correctional justice. It is an old prison, dating back hundreds of years, which, if its walls could speak, might reveal deeds of oppression, cruelty, and torture, which would make the blood curdle. The Conciergerie is an irregular pile, inclosed within the old structures of the halls of justice, (*palais de justice*), with walls of terrific thickness and solidity, with gates and bars of massive iron, and interpenetrated through and through with startling and horrible memories. As I was passing into the apartment where Maria Antoinette was confined as a prisoner of state, I was warned to be careful; but as the special point for caution was not indicated, and I was looking only to my feet, my head came into very unpleasant contact with the iron lintel over the door, which almost made me stagger. A gentleman at my side instantly remarked: "Maria Antoinette bumped her head on that same lintel when she was brought in here." The Conciergerie is deep below the present level of the adjoining streets. Its interior has a sinister aspect—dark, gloomy, repellant. In certain of its passages, lamps, kept burning at all times, give but a lurid light. Its yard resembles a well, whose sides bristle with points of iron, which prevent all scaling. There, until within a few years, were seen, sitting or walking along the wall, groups of prisoners awaiting trial in the court of assizes. But a cellular ward has now been provided for these, which surrounds a long rectangular court. In their place have been sent police prisoners, sentenced to a single day's imprisonment. Their day is passed in this yard. They pass the night on mattresses spread on the floor of the room, and the crowd is said to be often so great that even thus space is wanting. What of evil may not a single day and night spent under such circumstances accomplish? Is not the influence of depraved men, even for so short a period, enough to draw into the paths of crime an irresolute and feeble spirit?

§ 6. *The Grand-Roquette*.—This is a dépôt for sentenced prisoners, whether their sentence is imprisonment in a central prison, in the bagnio at Toulon, or in a penal colony, in which case they are confined here after condemnation till their removal to their final destination; or to death, in which case they remain here to the day of execution, which takes place near this prison. The number of prisoners varies from four hundred to five hundred. This prison has a certain celebrity among criminals, for it is, so to speak, the vestibule of the guillotine. The system is that of associated labor by day, and cellular separation at night. The courts are large and airy; and the discipline is more severe than in the other prisons of Paris. Every morning, as soon as it is fairly light, the scene becomes animated. The heavy iron gate, which bars the

entrance, is opened to admit a huge four-horse omnibus, which comes to convey to the railway the prisoners awaiting transfer. Before their departure barbers cut their hair in such manner that the skin of the cranium, appearing between the successive ridges, gives them a zebra-like appearance; this is the distinctive toilet of the galley-slave. After this, the convict is stripped and a thorough examination made of his whole person. When this scrutiny is completed he is reclothed in a new prison garb, and his legs are fastened together by chains long enough to allow him to walk, but too short to admit of his running. Bracelets are next attached to the wrists with a key, under conditions which make it impossible for him to bring his hands to his head. The roll is then called; each convict, in replying to his name, must state the amount of peculium to his credit, which is placed in the hands of the conductor, and not given to him till his arrival at the prison to which he is sentenced. Conveyed to the railway station in a cellular omnibus, the convicts are placed in a car divided into eighteen separate compartments, which they may not leave till they reach their point of destination.

A sickening tragedy had but recently been enacted within the walls of the Grand-Roquette, when I visited it in 1871. It was the execution, the assassination rather, of the venerable archbishop of Paris and the president of the court of cassation, by those incarnate demons, the communists of Paris—two men without stain of any kind, and whom all the good revered and loved. I saw, with a melancholy interest, the cells in which they had been confined, and the spot on which they were murdered; for, surely, it was nothing less or other than murder. With several others—a half dozen, or more, I think, of inferior rank and name, but as innocent as they of any crime against the state or against good manners—they were shot down as felons for whom the sun ought no longer to shine, or the earth to yield her fruits. From their solitary cells they were conducted in silence down winding stairs, along lengthened galleries, through open courts, (where the unaccustomed sunshine brought with it a gleam of joy to their wasted and weary hearts,) and between the massive double wall, to a remote and hidden corner of the prison. Here they were ordered to stand with their backs toward a platoon of sixty soldiers, only a few paces distant. This order the archbishop positively refused to obey, but boldly faced the murderous iron rain. His companions fell instantly, on the discharge of the musketry, but the archbishop did not; whereupon, at the word of command, two soldiers advanced and, with the muzzles of their rifles almost in contact with his person, discharged their death-dealing contents into his heart. I counted more than thirty places in the prison-wall just behind where the victims fell, on which the bullets had left their mark. Before his martyrdom the good man made this memorable declaration to his assassins: "You may take my life, but, in so doing, you will but add new force to the principle which I represent."

§ 7. *Sainte-Pélagie*.—This is a house of correction, which receives men sentenced to terms of a year and less. To persons sentenced for political offenses a special ward is assigned, which is entirely separated from the others. The average population of the prison is from five hundred and fifty to six hundred. An old structure, reared more than two hundred years ago, it is but ill-suited to its present purpose. All the repairs put upon it—and they are plentifully renewed year by year—have little effect. It bends, as it were, under the weight of time, and a foul and repulsive antiquity invests it with an air and an odor that are anything but agreeable. The prisoners have no dining-hall; they eat in the open court ;

there, also, they make their toilet, at a fountain. When it rains, they take their meals in a vast hall on the ground-floor, composed of a half-dozen or more chambers, whose partitions have been removed—with portions, however, of the thick walls left still standing, and offering, everywhere, obscure angles, into which the eye of the keeper penetrates with difficulty. It is in the terrible associations of this hall that the language of villany is breathed in whispers. It is there that they boast of their high achievements in the past; there that they plot new acts of crime; there that they prepare, in advance, the good strokes they will make when the hour of their release is come; and there that they organize those combinations which keep the police ever on the alert, terrify honest people, and weary the tribunals of justice. A man enters after having committed a peccadillo; he goes out schooled to crime and ripe for the galleys.

But labor is well organized at Sainte-Pélagie, and the workshops are hives of busy industry. You see there a ceaseless activity and good work done. With sleeves rolled up and hammer in hand, workmen are fabricating velocipedes; tailors, squat and cross-legged, are busily sewing garments for establishments of ready-made clothing; they make chains; they cut lamp-shades out of paper, &c. Until recently, they manufactured chignons at Sainte-Pélagie. That industry has been given up there; but I afterwards saw it practised on a large scale in the central prison of Melun. The hair, bought from doubtful heads, gathered little by little, from all quarters, drawn out by the comb, wound round cards, thrown into the street and collected by the hook of the rag-picker, is assorted by colors, divided according to the length, cleansed in a manner that scarcely increases its attraction, and fastened by the hands of prisoners on silken threads. Thence, when massed and arranged according to the rules of art, it goes to the Rue de Rivoli, in Paris; Regent's street, in London; Broadway, in New York, and wherever else ladies, not satisfied with the covering of the head provided by nature, imagine that they can increase their charms by additions of such dubious origin.

Sainte-Pélagie is surrounded by high and thick walls, on which are stationed at night a number of sentinels; but, despite this auxiliary surveillance, escapes can and do take place. On the 12th July, 1835, twenty-eight political prisoners managed to get away. When the director, in measureless fright, went himself to report the fact to his chief, the prefect of police, the latter dryly replied with a smile, "So much the better; the republic is deserting."

§ 8. *Saint-Lazare*.—This is an exclusively female prison, devoted to the reception and treatment of several classes: 1. Women awaiting trial or sentenced correctionally for terms of one year and under. 2. Women sentenced to a central prison and awaiting removal, or to death and awaiting execution. 3. It is a house of correctional education for girls under age, sentenced according to the terms of the penal code, or placed there by way of paternal correction. 4. Prostitutes correctionally sentenced as a measure of municipal police. For each of the above categories there is provided a distinct ward. The legal capacity of the prison is 1,150, but the prisoners are often in excess of that number.

The prison is an immense pile, very ancient, with an old and decrepid look. Originally a convent, it has been turned into a prison. Good, doubtless, for the first of these uses, it is exceedingly ill-adapted to the last. With large courts, shaded by venerable trees, it has wooden stairways, dormitories under the roof, workshops, taken apparently at random, huge refectories, lofty walls, a chapel large enough, but plain

almost to nakedness, and a neat little oratory, occupying the site of the apartment of Saint Vincent de Paul, which was the cradle of the religious order of the Lazarites.

For more than thirty years the prefecture of police has sought to change this state of things. It has protested, argued, pleaded for the construction of a house destined to receive female prisoners under sixteen years, and girls in their minority, confined by way of paternal correction. It has no power, no budget; it can only supplicate. But the municipal council has turned a deaf ear; it had no money. Meanwhile, magnificent barracks, splendid churches have been reared on all sides, but no house of refuge has yet lifted its walls where female children, who have fallen in a moment of forgetfulness, and whom it is necessary to save at any cost, and to give to marriage, to honor, to maternity, may find a retreat for repentance and amendment, away from the purlieus of public prostitutes and professional thieves.

What has been the result of this economy, which wastes souls to save dollars? Just such as might have been expected. Mr. Maxime du Camp, to whose interesting papers on the prisons of Paris in the *Revue des Deux Mondes* I acknowledge myself indebted for valuable facts and suggestions, and whose expressions I have not hesitated sometimes to translate, says that every young girl who enters Saint-Lazare as a correctional leaves it vicious and corrupted to the very core of the heart. And he gives convincing proofs of this, in which, however, I do not propose to follow him; but the conclusion which he reaches is, that whoever becomes an inmate there is lost, unless saved by a miracle. These young female correctionals work in association, but sleep in separate cells. All the other inmates are together day and night. In the dormitories the beds are pressed one against the other, and in the workshops the chairs touch. It is enough to mention this fact; its corollary is but too obvious.

At Saint-Lazare, in vast structures connected with the principal building, are found the general magazines and the bake-house of all the prisons of Paris. Day and night the ovens flame and the kneading-troughs are in use. The average of bakings is thirty-two a day each, yielding two hundred and thirty loaves. The magazine for clothing is a place most interesting to visit. Under the direction of an active and intelligent woman, the shirts, sheets, socks, and caps are ranged in different compartments. Farther on you see strait-jackets of sail-cloth, buckled with seven straps, intended to restrain the resistance of the furious, or paralyze all thought of suicide in prisoners condemned to death. In another place are seen winding-sheets of heavy brown linen, in which prisoners are wrapped for burial, who have at length dropped the chains of this present life. In still another apartment are piled the blankets, waistcoats, pantaloons, and other woolen garments, which have to be protected against the injury of moths. All the linen, all the clothing worn by the prisoners of Paris, goes from this wardrobe and comes back to it again, when it becomes unfit for further use. Every year there is a general sale of the articles which are no longer serviceable. Who would believe that the tattered garments which have been used in prisons have still a marketable value? But so it is. The old linen is bought by the hospitals, which make from it an excellent lint. Paper-makers, finding there genuine hempen cloth, are eager to obtain it for the manufacture of certain fine kinds of paper best made from that material. It is sought also by railway companies, who give it to the stokers to burnish the brasses of their locomotives. The woolen rags are bought, cut up, carded anew, spun, and woven into those light

cloths which manufacturers know how to make up into garments, which are sold at low prices and yet yield fair returns.

§ 9. *La Santé*.—This is the model prison of Paris, and is, without doubt, one of the best and most beautiful in Europe. It has been recently erected, at a cost of more than 5,000,000 francs. It was built under the immediate direction of Mr. Mettetal, a member of the National Assembly, a gentleman of great ability and worth, and profoundly versed, from study, not from experience as a prison director, in penitentiary science. It will be worth while to go a little into detail in describing this prison, in order to present, in outline at least, a sort of tangible embodiment of the ideas to which his studies brought him. The prison covers about seven and a half acres of ground, is built in the form of a trapezium, and is entirely separated from all other buildings. The constructions are divided into two distinct prisons, are built on two distinct plans, and are designed for two distinct classes of prisoners. One part of the prison is for the treatment of prisoners who have had their first hearing, and are awaiting trial, (*prévenus*;) this is constructed on the cellular plan, like Mazas, and can receive five hundred inmates. The other part is for the treatment of convicted prisoners, who have been sentenced to correctional imprisonment for terms not exceeding a year; it is composed of halls, workshops, common eating-rooms, and separate cells for sleeping; like the cellular portion, it has accommodations for five hundred.

The part of the prison designed for the *prévenus* (those awaiting trial) consists of four wings, each pierced by a large nave or gallery, flanked on both sides by three tiers of cells. Each nave is lighted, partly by glass placed in the roof, and partly by a huge bay-window at the end, protected by iron bars. The chapel, placed in the circular building in which the four radiating galleries of cells terminate, communicates with the prison of the sentenced, (*condamnés*,) by means of an intermediate or connecting gallery, called the "hospital construction," (*bâtiment de l'infirmerie*.) The rotunda is surmounted by a cupola covered with tiles, like the rest of the edifice, and on the two sides rise immense draught chimneys, which serve the double purpose of heat and ventilation. The prison for the sentenced, which occupies the narrower portion of the trapezium, is to the west of the cellular prison for those awaiting trial. The exterior walls of all these constructions are of immense square stones, cemented, the partition walls being in brick. The buildings designed for the accessory services are in the irregular courts between the wings, and are of hewn stone. Those for the use of the administration are at the bottom of the first court, or court of entrance. Here all the employés are lodged, without communication with the interior. Fifteen to twenty industries—the making of mats, umbrellas, candle-boxes, &c.—are carried on in this great establishment, the prisoners in separation working in their cells, while those in association labor in silence in common work-shops. Thus, classification, industrial labor, cellular separation for the *prévenus*, association in work and separation by night for the sentenced—such are the elements of penal treatment, such the agencies of reform, employed in the mixed prison of La Santé.

Each cell in this prison is 12 feet long, 6 feet wide, and 9 feet high, equal therefore to 648 cubic feet. So perfect is the ventilation that not the slightest disagreeable odor is perceptible even in those cells where the prisoners are confined day and night.

Ingenious contrivances for overcoming grave difficulties and securing valuable facilities abound in this prison. To give an example: The altar in the chapel, which, as already stated, is in the rotunda, is so placed that the officiating priest can be seen by every prisoner confined

in the four wings of the cellular ward, the door of his cell being set a few inches ajar and securely locked. At the same time the folding-doors of the congregate part, which form the partition between the two prisons at that point, being thrown open, every prisoner in association has also a full view of the ministrant. This is but one among scores of such contrivances, all due to the genius of Mr. Mettetal.

It cannot fail to have struck the reader that the two penitentiary systems, so different in themselves, in use at Mazas and Sainte-Pélagie, are united in the prison of La Santé; both of them, however, under greatly improved conditions. Here the prisoner sleeps on a real bed, which can be raised and fastened to the wall. The table is a flap, supported on an iron standard, with a hinge for letting it down. The chair is replaced by a stool. The floor of the cell is composed of oaken boards inlaid. A special chapel, or at least special church accommodations are provided for the prisoners of each faith, under each penitentiary system, viz: Catholic-cellular, Catholic-congregate, Protestant-cellular, Protestant-congregate; and, in like manner, a miniature synagogue is consecrated to the use of the few Israelites occasionally confined here. This prison is the only one in Paris which has a sheltered wash-house, built expressly for the purpose, where the prisoners, on rising in the morning, can perform their ablutions; a fact referred to, with keen sarcasm, by Mr. Du Camp, as showing how slowly reforms are introduced, when they have to make their way against the good-will of the budget. The courts here are spacious; and in the workshops air and light enter without obstruction, and therefore in quantities to meet every necessity of health and comfort. On this prison Mr. Du Camp makes the following remark: "In presence of these two opposite systems, which are here placed side by side, under the eye of the same director, an experiment is in progress, whose results it will be easy to record, and which will afford essential aid to those who are in search of a solution of the penitentiary problem. From records thus made up may be determined, after a sufficient lapse of time, which system sends back to the tribunals the largest number of recidivists." I must respectfully dissent from this opinion, and for the following reasons: 1. The prisoners of La Santé, subjected to the two systems, belong to essentially different classes, and their treatment has in view essentially different ends; consequently, there is a diversity in the premises, which would vitiate the conclusion. 2. The cellular system is applied, at La Santé, to prisoners awaiting trial; prisoners, therefore, whose guilt or innocence has not yet been determined, and who, as a further consequence, are not under criminal treatment at all. 3. There is no difference of opinion among enlightened penologists as to the application of cellular separation to this class of prisoners; all favor it as a matter of prime importance. 4. Even the correctionals at La Santé have, as their maximum, an imprisonment of only one year, and that of the greater part falls far below that limit. Cellular imprisonment for such short periods would furnish no *data* for conclusions relating to that species of imprisonment for lengthened terms. 5. There is a general, not to say universal, agreement among students of penitentiary science, that to give a sharp, energetic notice to first offenders, mainly with a view to deterrence, the best dose is a few months of strictly cellular confinement. 6. Experiments like that at La Santé, embodying the two systems, to furnish comparative results of real value, must be conducted under two conditions: *a.* They must embrace times of such lengths, and subjects of such a class, as belong to debatable ground. *b.* They must be applied by officers free from all prejudice in favor of the one

system or the other, so that their observations and judgments shall be absolutely impartial—a condition hard to be realized.

I cannot close this account of La Santé without stating the strong impression made upon me by the intelligence and courtesy of the director, as well as by the politeness of his staff, who vied with each other in the alacrity with which they answered questions, and, in every way, sought to promote the gratification of their visitor. The same remark will apply to the *personnel* of the other prisons of Paris.

§ 10. *La Petite-Roquette*.—This is a prison, or, speaking technically, a house of correctional education, for juvenile delinquents of the male sex. There are received into it prisoners of four classes: 1. Children under sixteen, arrested but not tried. 2. Children of the same maximum age, under sentence. 3. Children *in transitu* to agricultural colonies. 4. Minor children, against whom their parents have obtained a decree of correctional imprisonment. It is on the cellular system. Think of it! Babes, almost, shut up for weeks and months in a cell! They have even separate exercise-yards. They have hoops there which they trundle in the few square yards allowed them. But the place is too strait; the hoop strikes the wall after two or three revolutions, and the children, weary of this mere mockery of play, sink down upon the ground to dream of some place of real amusement. Separation by day, separation by night, separation at meals, separation at work, separation in play-time, separation always and everywhere, and that in the case of children, the very age when freedom, play, and motion are almost an essential condition of existence—certainly an absolute condition of healthy existence. It is the saddest prison I ever saw; and it would be intolerable if it were not for the “Patronage Society for liberated juveniles of the department of the Seine,” to be hereafter noticed. Mr. Du Camp has well remarked that La Petite-Roquette is perhaps the most important prison in Paris, because its inmates are children whom it is necessary to snatch from crime, and to lift up to industry and virtue; and that therefore it ought to be managed on a different principle, and placed near Paris, on some large farm, where the children could feel the benign influence of the sun and the open air.

§ 11. *The central prison at Clermont*.—This is the largest female central prison of France; it is also the best conducted and the most successful. The site is magnificent. It stands on an eminence just outside the city, and commands a prospect as extensive as it is charming. The *germ* of the prison was an old castle of the middle ages, in which the first of the Bourbon kings was born. I was shown through the prison by the director himself, Mr. Baille, who explained everything with the utmost patience. The discipline I found equal to that of the Albany penitentiary. The order and cleanliness were most admirable. The floors of all the apartments, including the kitchen, were white from constant scrubbing. The tins, coppers, and brasses were scoured and burnished to the last degree of brightness. The prisoners’ beds were made of a mixture of wool and horse-hair. The sheets were like snow, and the gray blankets had an unusually tidy appearance. To the question how often the sheets were washed, the director replied, “Just as often as they need it;” and their appearance showed that the answer was not a cover for official neglect, but the literal truth. In reply to another question, he said that the underclothing of the prisoners would be washed three times a day, if such a thing should be necessary to cleanliness.

The women sleep in common dormitories (a plan not to be approved)—seventy-five to one hundred in an apartment—with a sister in an

adjoining room, and a monitress, herself a prisoner, in the dormitory with her fellow-convicts. There are four dining-halls. Underneath each table, and forming a part of it, is a box of the same length, divided into as many compartments as there are occupants of the table—one for each—in which they keep their salt, pepper, and vinegar, together with whatever they may have purchased for themselves. But how do prisoners come into the possession of money? I will explain. There are three kinds of sentence to the central prisons, viz, simple imprisonment, reclusion, and hard labor. The last-named of these sentences, in the case of men, are, with a few exceptions and for special reasons, served out in the bagnio at Toulon or the penal colonies; but in the case of women, in the central prisons. Now, the net earnings of all French prisoners are divided into tenths. Of these tenths, prisoners sentenced, for the first time, to simple imprisonment receive five; those sentenced to reclusion, four; and those sentenced to hard labor, three; but, in all cases, prisoners whose conduct and industry are exemplary in the highest degree may, in the discretion of the director, receive an additional tenth. *Per contra*, on each recommittal the prisoner's share is reduced one-tenth; with this reserve, however, that the last tenth can never be taken from him, so that hope may never be wholly lost. On this point it may be further stated that, in addition to the portion to which prisoners are legally entitled, the contractor may allow to particular individuals such quantities as he pleases, as a stimulus to diligence. The portion of earnings allotted to the prisoners is called *peculium*, and, in every case, it is divided into two parts—disposable *peculium* and reserved *peculium*. The latter, called *masse de réserve*, is kept for the prisoner to the day of his liberation; the former is at his disposal for the purchase, during his imprisonment, of little comforts, additional to the fixed prison rations, such as tea, milk, butter, cheese, bread, &c. This is done at the *cantine*, already explained in my account of the prison at Neufchâtel.

To the question, put to quite a number of the women, as we passed through the prison, whether they found the *peculium* an encouragement and stimulus, the answer was uniform, as it was prompt and emphatic, that they did. Some of the convicts at Clermont, who are engaged in the more skilled of the industries practised there, such as corset and dress making, earned for themselves 70 francs, equal to \$15 per month. The director informed me that he had paid women, on their discharge, as high as 4,000 francs. But these, of course, are exceptional cases. After the above statements, it will not seem wonderful that the contractor takes these women and agrees, for the product of their labor, to defray the entire current expenses of the prison, save the cost of the administration, food, clothing, bedding, ordinary repairs, &c. It is thus seen that, leaving the administration out of the account, this prison is self-supporting. There is but one other in France—a male central prison—of which so much can be said; and which, according to the official reports, not only pays its way, but earns a small surplus.

There is a department of this prison (and it exists in several others of the same class) of much interest, called “the ward of preservation and reform,” (*quartier de conservation et d'amendement*.) On the arrival of a convict, an inquiry is instituted into her past character, conduct, and the circumstances of her crime. This inquiry is conducted by a kind of court, consisting of the director, sub-director, chaplain, inspector, and matron. If it is found that she had previously borne a good character; that she had never before committed a crime; that her present offense is one not implying grave moral degradation, and that she has been reared in an honest and respectable family, she is placed in the ward of

preservation and reform. This ward, at the time of my visit, had fifty inmates. It had then had an existence and a history of six years. Of one hundred prisoners who had been discharged from it, not one had come back. Its inmates are as much separated from the rest of the convicts as if they were confined in different prisons.

On our round we visited, as a matter of course, the prison school, where were a hundred women engaged in the several exercises of reading, writing, and calculating. A more quiet, well-behaved, industrious set of pupils I never saw. A sister told me that they were very quick in mastering the difficulties of arithmetic, and of their progress in penmanship I had ocular proof. A girl who could scarcely scrawl a few letters when committed, wrote an excellent engrossing hand, and there were others not much behind her. The conditions entitling prisoners to the advantages of the school are: good conduct, sufficient intelligence, and an age not exceeding thirty-five years.

There is a library at Clermont of 700 volumes, not large considering the size of the prison; but, owing to constant occupation, the prisoners did not appear to have any great amount of time for reading at their disposal. However, seats are provided in the exercise-yards, and it is permitted to either walk or sit during the daily half hour passed there. Such as choose may devote this time to reading. The prisoners are often read to by the chaplain or a sister during meal-time. They have also a good deal of time on Sunday, during which they either read or listen to reading in the workshops.

Some interesting statistics were furnished me for 1869, as that had been a normal year, which 1870, the year of the Franco-German war, was not. The average prison population for that year was 736. There remained in prison at the end of the year 664, of whom were sentenced to simple imprisonment 379; to reclusion, 70; to hard labor, 215. The net product of the prisoners' labor was 223,224 francs; gratuities paid prisoners by contractor, 6,631 francs; total, 229,855 francs. Peculium of prisoners, including contractor's gratuities, 93,975 francs; contractor's share of net earnings, 137,880 francs; total, same as before. Judged by the number of punishments inflicted, the conduct of the prisoners must have been remarkably good, the average being but a small fraction over one a day. They were distributed thus: To prisoners sentenced to simple imprisonment, 650; to reclusionaries, 52; to hard-labor convicts, 107; the number of prisoners in the first class being 379; in the second, 70; and in the third, 215. A remarkable feature of this exhibit is that the prisoners who are sentenced for the lowest grade of offenses commit twice as many breaches of discipline, in proportion to their number, as those convicted of the next grade, and four times as many as those sentenced for the highest grades, and that a similar disproportion exists between the number of disciplinary offenses committed by the two last named of these classes. The conclusion from which would seem to be that the worst criminals make the best prisoners, on the principle, perhaps, that "practice makes perfect."

Although, as already explained, there are three kinds of sentences to the central prisons; yet, as far as treatment is concerned, these distinctions are nominal. All prisoners work together in the same shops, sleep in the same dormitories, and are in all respects subjected to the same régime.

§ 10. *Male central prison at Melun.*—This is one of the best and most successful, both economically and morally, of the French prisons. It had seven hundred inmates at the date of my visit. In cleanliness, order, discipline, and material effectiveness, it seemed almost perfect.

It has fourteen large workshops, arranged on the two sides of an immense building, with a wide hall running through the middle from end to end, from which you enter the several shops, in each one of which a different trade is carried on. I never saw workshops more conveniently arranged or better ventilated. The industries appeared well organized and effectively conducted. The moral appliances are evidently better here than in most other prisons of its class, for while the average relapses in the central prisons exceed 40 per cent., at Melun it is less than 20. Every morning there is held, in a room called the pretorium, a prison court, composed of the director, sub-director, inspector, chaplain, and perhaps some other officers, where all offenders against prison regulations are arraigned, heard, and judged with the same strict regard to justice as offenders against the laws of the land are in courts of criminal jurisdiction. This court is found, I think, in the central prisons generally, perhaps universally; it certainly is at Clermont. It is the feature most to be commended in the French penitentiary administration.

The ward of preservation and reform I found at Melun as at Clermont, and with the same good results. There are also in this prison certain cells, called cells of repression, designed for the separate confinement of dangerous and incorrigible prisoners, as the others are for that of prisoners of whose return to virtue good hope may be entertained.

The director at Melun impressed me as being a man of extraordinary intelligence, ability, and force of character.

§ 11. *Departmental prisons at St. Omer.*—I had a young friend at this ancient city, Mr. A. Corne, with whom I had corresponded for a number of years, who met me at Calais, where we first saw and embraced each other, and whom I accompanied to his official residence at St. Omer, where he held the position of sub-prefect of the department of Arras. He was a young man of rare ability and large attainments, evidently one of the coming men of France; but he has since passed away from earth, when only the first fruits had been gathered of what must have been, if his life had been spared, a full harvest of usefulness and honor.

At St. Omer I inspected two departmental prisons, viz, a house of arrest and a house of justice. The first was a prison for persons arrested and held for trial before a correctional tribunal or a court of assizes, (*les prévenus et les accusés.*) The building is old, ill-arranged, badly ventilated, and, in the basement-story, damp and unhealthy; though we have worse prisons in America. The prisoners are in common rooms by day and common dormitories by night, being thus in association the whole time, with every opportunity for mutual contamination. The second was a larger as well as less ancient structure, designed for persons sentenced to an imprisonment not exceeding three months. It was undergoing extensive repairs, and promised to be, when these were completed, a fair prison of its class, but still highly objectionable on the ground of its common dormitories. The labor, as in the French prisons generally, is let to a contractor, (*entrepreneur.*) The contractor assumes the obligation to furnish the supplies of food, clothing, and other necessary articles, at such a price, for a term of three, six, or nine years, and, in part payment, he has a right to the labor of the prisoners, but no right of control over them, or of interference with the discipline. He cannot even introduce an instructor or foreman, distinct from the *personnel* of the administration; he gets simply the product of their labor, having the right to introduce such proper industries as he pleases and the obligation to furnish occupation to the prisoners at all times.

There is another and higher class of departmental prisons, called the house of correction, to which prisoners are sentenced for a term not

ceeding one year ; but this is always at the chief city of the department, and, as St. Omer does not hold that rank, I did not see it.

§ 12. *A quasi prison.*—There is an establishment at St. Omer of a somewhat miscellaneous character, half prison and half something else. It is for the treatment of women and girls, and is under the care of the Sisters of the Good Shepherd, who are specially devoted to labors of this kind. It numbered, when I visited it, four hundred and fifty inmates, made up of four different classes, or *categories*, as they are named by the sisters. The first category was of prostitutes, one hundred and eighty in number. Most of them were young, though none are excluded on account of age. They remain many years in the institution, and it is claimed that the greater part become thoroughly reformed. For the support of this class the state allows 40 centimes (equal to 8 cents) each a day. The second category is much smaller, consisting of a select few from the first, who, because of the thorough confidence reposed in them, are in training to become sisters themselves. The third category is of girls, mostly from very bad families, who, having been convicted of some petty offense, are placed here for safe-keeping and reformation. For their maintenance the state also pays 40 centimes each per day. The fourth category consists of younger girls, orphans for the most part, either in fact or because of the desertion or vices of their parents. This is simply an industrial school, toward whose support the state pays nothing. It is a charitable institution, sustained by the gifts of the benevolent and the labor of the children. Each of these four categories forms a community by itself, entirely distinct from the others, having different buildings, refectories, schools, dormitories, &c. Their only industry is sewing—shirt-making chiefly—and their average earnings are about 35 centimes a day.

This institution, so novel in its plan, appeared to me to be one of great merit and usefulness.

§ 13. *General remarks on French prisons.*—*a.* The same characteristic—the same defect, I may say—struck me as inhering in the French as in the English prison administration ; indeed, it is not peculiar to those countries, but belongs to all, though in different degrees, and, I am grieved to add, to far too great an extent in my own. I refer to the greater attention given in them to material than to moral efficiency ; the greater effort made to secure the former than the latter. The central prisons are models of order, regularity, labor, neatness, and discipline ; but intimidation, deterrence, seems to be their chief aim. Material order is carried to its highest power ; moral order seems rather languid. Little effort, little thought even, appeared to me to be given to reformation. The system punishes, but does not amend. The administration, the legislature, the country feels this profoundly. Hence the warm interest taken by France in the congress of London. Hence, too, the important measure recently inaugurated in the national chamber under the lead of the Viscount D'Haussonville ; I mean the creation of a great commission of thirty of the picked men of France, charged with the duty of studying anew the whole penitentiary question, and suggesting the reforms needed in the penitentiary system. I had the pleasure of witnessing the deliberations of that body during an entire sitting of three hours ; and I feel persuaded that results of the highest value to France and the world may be anticipated from its labors.

b. As the fruit of the state of things described in the last paragraph, relapses increase, and the number of recidivists multiplies, from year to year, despite the many ameliorations introduced within the last half century into the penitentiary *régime*. Such a result shows the ineffi-

cacy of the principle of intimidation, when exclusively or even chiefly relied upon, and the necessity of introducing into the system, as a living element, the principle of reformation. To justify what I have said as to the increase of relapses, I cite from a work on the Prisons of France, by Pastor E. Robin, an eminent French penologist and philanthropist, who states that the percentage of recidivists in the central prisons had risen in four years (1864–1868) from 34 to 42. The latest report of the administration seen by me, that for 1871, if my memory serve, (for I have not the document at hand,) makes the recommittals in those prisons 44 or 45 per cent. In the prisons of Paris the percentage of relapses is still greater. In 1868, 60 per cent. of the prisoners arraigned before the tribunals of correctional justice had been convicted before, and of those arraigned before the court of assizes, 45 per cent. Mr. Du Camp observes that this large number of relapses proves that repression, intimidation, deterrence, is not enough; that it is necessary to repudiate the old *lex taliones*, (law of retaliation;) that, if it is just to punish, it is essential to reform; and that to attain this end, offered to every civilized nation, the prison must be made a moral hospital.

c. The wards of preservation and reformation, found at Clermont and Melun, have already been noticed. Others exist in the female central prison of Haguenau, and the male prisons of Fontevault, Poissy, Eysses, and Gaillon. The name given to this institution, ward of *preservation*, as noticed by viscount D'Haussonville in the report with which he introduced into the chamber of deputies his proposition for a penitentiary commission, suggests a pregnant reflection, viz: That, in the judgment of the administration itself, the simple fact of an imprisonment in these establishments is likely to add to the depravity of their inmates. This, continues the viscount, is a sad confession, but one which it is necessary to weigh carefully, without reproach to the administration, whose good faith and zeal it attests.

d. The dietary of the French prisons appears to have been brought down to the lowest standard, and is scarcely sufficient to meet the average necessities of the prisoners; certainly not of those whose appetite is strongest. This fact is noticed by Mr. Du Camp, who says that the food furnished to the inmates of the prisons of Paris is not sufficient for all, and that some would suffer from hunger if the *peculium* did not enable them to make some purchases at the *cantine*, which is found in every French prison. The *cantine* is an establishment belonging to the contractor, there being but one contractor allowed in any of the central prisons. The average proportion of the earnings assigned to the convicts does not vary much from four-tenths. The contractor reserves the right to sell to the prisoners, at prices fixed by the administration, supplementary articles of food—such as bread, meat, vegetables, &c. He thus pays the prisoner his *peculium*, and receives nearly one-half of it back again for commodities sold to him, in this manner retaking with one hand what he had given with the other. By such an arrangement the administration seems to confess that the rations are scarcely sufficient; and what makes this still more evident is the fact that those prisoners who are employed in the service of the house, (*service economique*), and therefore get no *peculium*, receive some *sous* from the administration, with which to purchase articles from the *cantine*.

§ 14. *Mettray*.—*La colonie agricole et pénitentiaire* at Mettray, five miles distant from Tours, in the fertile and charming valley of the Loire, was the only reformatory institution which the time at my command permitted me to visit in France; and there I had the great happi-

ness and honor of passing two days as the guest of the good man who founded it—M. Auguste Demetz. To describe Mettray in detail, in its organization, workings, and results, covering, as its history now does, a period of thirty-four years, would require a volume; whereas a glance is all that my limited space will allow. At the meeting of the Universal Alliance of Order and Civilization, held at Paris in the month of June, 1872, Mr. Demetz presented a paper under the title of “An Exposition of the System of Education employed at the Agricultural and Penitentiary Colony of Mettray, and of the House of Paternal Correction,” (*maison paternelle*.) This paper is in the nature of a report, which, as a matter of course, gives the latest as well as the most authentic information relating to this world-renowned establishment. Not only shall I not hesitate, but rather regard it as a duty, to supplement my own notes and recollections by the information afforded in this report, and in some other recent publications on the subject, notably those of Mr. Charles Sauvestre and Miss Florence Hill; and that without feeling obliged always to employ the *ipsissima verba* of those authors, or to incumber my pages with formal references or quotation marks. For a number of years the average population of Mettray has been not far from 700; at the time of my visit, August, 1872, it was 792. Of the 4,287 children received at Mettray since its foundation, 647 were illegitimate; 1,657 were orphans by the loss of one or both parents; 291 were foundlings; 595 had step-fathers or step-mothers; of 381 the parents were living in illicit union; of 889 the father, mother, brother, or sister had been in prison; and of 7 the father or mother had been sentenced to capital punishment. What a multitude of young immortals, almost without exception the children of poverty, misery, neglect, and crime; of evil surroundings and evil influences, whose name is legion! What a fearful catalogue of exposures! How few and faint the chances of victory in such a battle; how almost certain the issue of defeat and ruin, unless some helping hand, strong to deliver, should be stretched out to the rescue. It was the sight of these exposures, and the certainty of a disastrous issue in the greater number of cases, which caused M. Demetz to abandon a career that was opening to him the highest judicial honors of his country, and devote himself to the salvation of imperiled childhood and youth. He traversed Europe to find a model, and found it in the Rauhe Haus, near Hamburg, established six years before, by Mr., since Dr. Henry Wichern. It was the separation of the children into groups, called families, and the making of farm-work their principal occupation, which most struck his imagination and won his judgment in the Rough House. He chose the family principle as the basis of his proposed establishment on a twofold ground—one having reference to the officers, the other to the children. Division into families, he considers, makes superintendence more easy, direct, and kindly; more easy, because it extends over only a small number; more direct, because it brings responsibility home to one person; more kindly, because its tendency is to awaken in the head of the family, and his assistants, the sentiments of sympathy and affection. Upon the children themselves he regards its influence as no less beneficial. The authority exercised over them is paternal; they become attached to their house-father; and this mutual affection becomes a moral force of incalculable power. Then, again, this division into families (such is his mode of reasoning) facilitates the individual treatment of each child. Individualization is an indispensable element in reformatory treatment, which renders it, in the opinion of Mr. Demetz, a grave error to economize in the number of agents employed in the work. He holds that the family is the supreme of moral forces which

act upon the human race, and that every man is a reflection of the influences in the midst of which he passed his earliest years. The power of example upon the young is omnipotent. Whence can the child, reared by irreligious, disorderly, vicious parents, draw those moral principles which are the safeguard of all? The family either kills virtue, or breathes into it the breath of life. The task proposed to himself by the founder of Mettray was to create a moral constitution in the criminals who became his wards, and to substitute for the family which ruined, a family which will save them. He acknowledges that it is a fictitious family which he gives them, but claims that it has all the solicitude, all the tenderness even, of a real family. The chief takes the title of father of the family, and has all the devotion implied in that designation.

The advantages of this division into families show themselves more sensibly from day to day. M. Demetz thinks that disciplinary action and moral action have been, hitherto, too much confounded. A regiment may move at the word of command, a ship's crew at the sound of the boatswain's whistle; but recourse must be had to other agencies if our aim is to affect moral character. For this reason too many children must not be confided to the same person; and the agents must be multiplied, under penalty of simply *rearing* instead of *educating*. It is, so to speak, in single combat that we must wrestle with these young souls, if we would conquer their evil inclinations and kindle in them the sentiments of honor and virtue.

M. Demetz avers that he has taken for basis of the reformatory education of Mettray, the religious sentiment; for a bond of union, the family spirit; for order, military discipline—three elements, each strong in itself, but of immense power to hold man to duty, when combined and made to act in unison toward the same end.

The chief industry at Mettray is agriculture. The device adopted for the colony is, "To improve the earth by man, and man by the earth;" and that principle is carried out to the fullest extent. *To defend the soil, and to enrich it*, is the mission to which the colons of Mettray are called.

How well these brave youths have fulfilled the first part of this mission the following facts attest: All the colons who were from seventeen years of age to twenty, joined the army the moment the French soil was invaded by the Germans in the late war, to the number of one hundred and eighty, and fought with unsurpassed bravery. Many died on the field of battle; many others were wounded; numbers distinguished themselves by acts of special valor; four were decorated with the ribbon of the legion of honor, and nine with the military medal; and four received commissions as officers. Among those who received decorations, Mettray names with honorable pride one of her colons, aged nineteen years, an under-officer of engineers, who, during the siege of Metz, crossed the Prussian lines six times to obtain information, and report it to his general.

As regards the second part of their mission, as named above, almost the entire population of Mettray is engaged in agricultural labors during the months of spring, summer, and autumn. A vast domain, composed of a number of farms, is cultivated by them. To save time and fatigue in going to and from work, the colons are, to some extent, distributed in different localities. The main body is at Mettray, but there are two outlying establishments, to which the older boys are drafted, as their good conduct and trustworthiness merit such a distinction, for here they are under much less restraint, and live, in all respects, more like ordinary hired laborers on a farm. From one of these establishments the

boys come in and spend Sunday with the main body of the colons; but from the other only on extraordinary occasions. These outlying posts form a sort of intermediate establishment, similar to that at Lusk, under the Crofton convict system, and serve as a stage of provisional or preparatory liberty.

But though the tilling of the land is the chief employment at Mettray, and is undoubtedly better than any other for moral training, yet industrial occupation, at a variety of trades, is also provided; but these trades are all such as are required for the production of implements either for farm-work or for articles to meet other needs of the establishment. Besides the shops for the manufacture of carts, plows, harrows, rakes, &c., there are carpenters, masons, millers, tailors, sabot-makers, painters, glaziers, tin-workers, &c.; for the colony is almost wholly self-supplied. But all the colons, who work at these various handicrafts in the winter and such other times as may be necessary, also labor in the fields in summer. Thus they become master of two industries, and can be employed alternately as wheelwrights and farm-hands, a fact which makes them extremely serviceable, and causes them to be much sought after by the neighboring farmers.

As I have already said, there were seven hundred and ninety-two boys at Mettray at the date of my visit. They are divided into households of fifty, each under the care of a superintendent, called the chief or head of the family, (*chef de famille*), and an assistant who has the title of the eldest son, (*fils aîné*.) Thus are the ties of social affection re-established by a kind of adoption with a moral force that nothing ever destroys. These ties are so powerful, the attachment felt by the former colons of Mettray is so strong, that they return with joy to recount their successes in life. Every Sunday those who have found employment on the neighboring farms, come to pass the day of rest at the old home, and to take part in the exercises of their comrades. I found things at Mettray precisely as described by Mr. Sauvestre, and therefore gladly avail myself of some sentences taken from his account of the "System of Education." He remarks:

I will now try to give an idea of the mode of education adopted at Mettray, and show the ingenious means and delicate precautions by which the hearts of its youthful inhabitants are touched and softened, and their ill-feeling, craft, and perverse instincts, which before menaced society, are converted into salutary and friendly forces. I have spoken of my arrival at the colony, across parks and gardens, and how I found myself in the middle of the square without having encountered a single barrier. I came again the next day, about the same time; it was during the play-hour, and the children were amusing themselves before dispersing to the workshops. There were no walls, nor ditches, nor inclosures of any sort, nor even any guards. The games were all in full swing, when suddenly a bugle sounded; at once play was stopped, and at another bugle-call the children divided themselves into companies, according to their work. Then the band began a joyous strain, and the different groups in military style marched past the heads of families, led by their foremen. Here are agricultural laborers, gardeners, wheelwrights, millers, shoemakers; and others on their way to the school. When all had filed past, the musicians hastened to put away their instruments and join their several gangs. They go to their work as to a fête, with music to begin the day and enliven their departure; and come rain or sunshine, they bear it cheerfully and joyfully. Everything is done that can make duty attractive and induce a constant habit of performing it. The children are not pushed forward with rudeness; great care is taken not to bruise these poor young hearts, already frozen by neglect or withered by vice before they knew anything of life; they are carefully tended, and led on by degrees to goodness with gentleness and trust. It is considered a great privilege to be in the band, and one only earned by hard work and good conduct.

The heart first, the physical powers next, and then the intellect; this is the order at Mettray.

If the colons of Mettray are the object of a constant solicitude while

they remain at the colony, they are scarcely less so after they have left it. M. Demetz holds that there is no good penitentiary system without patronage, since the good moral principles which may have been implanted by the discipline of the prison, still weak and wavering, need some extraneous support to guard against the danger of a fresh fall. He considers that it is the same with the sicknesses of the soul as with those of the body, where the moment of convalescence is the most critical of all, and requires the greatest care. On this principle, the patronage of Mettray is kept up not only during three years, as is the custom in other similar institutions in France, but its duration has no limit; it is, in effect, a real adoption. Provision is made against whatever might be of a nature to compromise the future of the youths who have been discharged from the colony. Thus they need have no fear as regards want of employment, in consequence of which the workman who has no resource but the product of his labor is too often exposed to all the suggestions of want and misery. Whenever the liberated colons are without work, they return to Mettray, where they know they are ever welcome, on the sole condition that they work with energy; for M. Demetz regards it as of the last importance that they preserve those industrious habits which they formed at the colony. They are not permitted to leave until a new place has been found for them. So, also, when they are sick, they are received into the infirmary of the colony. Nor is it requisite to such admission that the ex-colon be so sick as to make it necessary that he should keep his bed; it is enough that he be unable to devote himself steadily to work. M. Demetz is of the opinion that there are indispositions which compromise the future of the workman more than a grave disease. In such cases, the workshop is closed against him because he is not well enough to labor, and the hospital refuses him admission because he is not sick enough to be nursed; but Mettray willingly opens its gate and extends to him the needed relief.

Upon the whole, after the widest and most careful inspection which two days would permit me to make, I have no hesitation in saying that Mettray appeared to me the most perfect, the most complete, the most thoroughly wrought out, and the most effectively applied system of reformatory discipline that had ever fallen under my notice. The late eminent recorder of Birmingham, England—Matthew Davenport Hill—whose opportunities of observation were far larger than mine, likened Mettray to a great and beautiful work of nature, rather than to any production of man. Nor to one who has been there and seen the wonderful creation will this comparison seem much, if at all, exaggerated. The resemblance is found both in its gradual development and in the discovery of fresh perfections the more closely it is examined. Everything about the establishment, whether in the labor, the discipline, the instruction, or the recreations—the farm, the workshop, the school, the church, the playground, the dormitory, the infirmary—all, all, without exception, seemed to converge to one point, and to have been made to yield their tribute to the great work in hand—the rescue and salvation of these young criminals, their restoration to society, with the power and the will to pursue a career of honorable, though, perchance, quiet and unheralded usefulness. The genius of M. Demetz has shown itself equal to every exigency, every emergency of his work; and in its power of originating expedients to re-awaken, almost to create virtue, though, being human, it must have a limit, it certainly has not yet reached that limit; for it is still teeming with contrivances to the same beneficent and godlike end. *Facile princeps* among reformatory men is the position readily yielded to him by the

whole body of his fellow-workers. Let the laurel be worn by him whose merit has won it.

And what has been the result of this great work? Mr. Béranger de la Drôme, in his day the highest authority in France on penitentiary matters, says that, prior to the founding of Mettray, the proportion of relapses among juvenile criminals was 75 per cent. What is it among the *élèves* of Mettray? Not more than 5 per cent. at the outside. Well does Mr. Sauvestre, in view of this state of things, exclaim, "Is not Mettray a living witness against the old doctrine of repression? What would these children have become, if sent, as had previously been the custom, to the central prisons, those educational establishments whence the inmates often go out worse than they came in?" The founder of Mettray has substituted education for punishment; to what saving effect may be seen even in the very imperfect delineation which has just been given. What precious fruits of the same kind might not our prisons for adults show, if education—meaning by that term not simply scholastic instruction, but a complete system of industrial, mental, and moral training—were *combined* with punishment, and reformation everywhere made, as at Mettray, the real and supreme aim of the treatment!

After completing my observations at Mettray, I said to M. Demetz, "You have created the best reformatory in the world." Promptly, and with a beautiful modesty, he replied, "It is because I have had the best assistants in the world." The answer was no doubt true, but not the whole truth; for the helpers of M. Demetz have been his own creation, as well as every other part of the establishment. This leads me to speak, though it must be all too briefly, of a most interesting department of the colony, its preparatory school, (*école préparatoire*), as it is called. This right arm of Mettray was created even before the colony itself. After the original buildings had been completed, M. Demetz, impressed with the just idea that the task of changing bad boys into good ones* was not one to be committed to the first comers, spent an entire year, as he informed me, aided by his devoted colleague, the Count de Courteilles, in training some twenty young men to be associated with them as assistants in their work. This school, enlarged in its curriculum and its number of pupils, and embracing a three years' course of study and training, has been kept up ever since. It is a regular normal school, specially designed for Mettray, but supplying assistants to other similar establishments. So essential does M. Demetz consider this school to the complete success of his work, that he has been often heard to say that if it were closed, the colony would be destroyed. It is through it that he obtains those devoted and efficient sub-officers, for whom Mettray has ever been distinguished; and through it, especially, he secures that unity of sentiment and of action, so indispensable in his great work of moral transformation, whereby a desolate and barren wilderness is made to rejoice and blossom as the rose. How devoted his helpers are to his person and his work will appear from two simple facts which may be told in few words. M. Demetz had secured for one of his agents a place where the work was lighter and the pay larger, and was himself accompanying the young man to introduce him to his new employer. While on the way, overcome by a sentiment of longing regret, he said: "M. Demetz, it is *impossible* for me to leave Mettray;" and despite all persuasions, back he went to his smaller remuneration and his harder, rougher work. The other fact is this: During the late Franco-German war, the live stock of Mettray—cattle, pigs, and horses

*And, *a fortiori*, bad men into good ones. E. C. W.

—had been taken by the enemy; the revenues of the colony were in great measure cut off; and half the members of the staff had felt it a duty to give themselves to the military service of the country. The half who remained, after consulting together, went in a body to M. Demetz, and said: "Sir, we know your embarrassments, and will gladly do double work and accept half pay till the state of things shall improve." M. Demetz thinks, and rightly no doubt, that such devotion could be secured only through the *école préparatoire*, and that mere chance employés would be incapable of such self-sacrifice. Mr. Hill, after a visit to Mettray in its earlier years, gives his impression of the agents in this strong language: "The founders have breathed their own earnest benevolence into the hearts of their coadjutors. Seldom have I felt so deeply interested as in the hours I spent with these amiable and intelligent young men. Their devotion to their employment, their perfect knowledge of all the principles on which the institution is founded and of the best means for carrying these principles into effect, their enthusiastic attachment to the generous men to whom France and the world owe this noble establishment, the kindness evinced in their demeanor toward their wards, and the grateful spirit in which their notice of these poor lads was received, left me no room to doubt that I was among realities, not surrounded by mere shows and forms." Every recent visitor at Mettray will agree that the venerable recorder of Birmingham has as truly described the agents of to-day as he doubtless did those of twenty-five years ago.

I am unable to state what proportion of the current expenses of the colony is met by the labor of the colons; certainly not the whole, as at the reform school at Ruyssede, Belgium. M. Demetz says that some persons allege that *Mettray is too dear*. To this he replies, first, that Mettray does a great deal of good; and, secondly, that, in the matter of economy in charity, there are cheap purchases that ruin, as there are costly ones which enrich. It is the unusually large proportion of agents which has made the cost at Mettray high, as compared with other French reformatories; but it is to that also that the large percentage of reformatations is chiefly due. The motto of Mr. Demetz on this subject is, "Reform as cheaply as you can, but *reform*."

On the same premises as the colony, but in no way connected with it, M. Demetz has organized an institution as novel in its plan as it is beneficent in its scope and action. This he calls a house of paternal correction, (*maison paternelle*.) An unhappy father, who foresaw nothing but ruin for his son, one day said to M. Demetz: "You have created an admirable institution for rescuing from vice the children of the poor; can you do nothing to save those of the rich?" Instantly his fertile mind conceived the idea of the *maison paternelle*. This is, in fact, a college for the reception and treatment of those sons of the upper and wealthier classes, with whom, because of their idleness or insubordination, the ordinary appliances of college discipline can accomplish nothing. Before M. Demetz founded his institution, which might be named a college for insubordinates, expulsion from the ordinary college was almost the only severe measure that could be employed. But so far from being a terror, it was often welcomed by the idle youth as a relief from what was felt by him as an intolerable burden. When one of these youths was reminded by a professor that, if expelled from one college, he could be received into no other in France, his prompt reply was, "So much the better; I shall then have a vacation without end." The system employed in the *maison paternelle* is that of absolute isolation, each student having two cells—one for study, the other for sleep—

with a small exercise-yard adjacent. After being placed in this establishment, he continues his lessons the same as at the college from which he has been temporarily removed, under competent professors obtained from the neighboring college of Tours. He sees none of his fellows, and feels no evil influence from their presence. Thus, left wholly to his own reflections, he retires within himself, and, generally, from one to two months is found a sufficient time to subdue his spirit, to change his habits, and to restore him to the institution from which he came, the joy and pride, instead of being, as before, the grief and shame of his family. Nothing is found so efficacious in conquering idleness as the discipline of the *maison paternelle*. Labor, which has been an object of aversion, becomes there a necessity and a consolation to such a degree that books are taken from the students as a punishment for negligence, and the want of occupation so weighs upon them that they soon beg to have them restored. Their studies are thus pursued without interruption, and with greater regularity, because free from all distractions, than under the ordinary conditions of scholastic life.

On the arrival of a pupil M. Demetz exhorts him to a quiet and obedient behavior, assuring him that he has no quarrel with his person, but only with his faults. He says to him: "Your god-father has answered for you before God; I answer for you to your family; show yourself docile, and you will have another friend to love you; resist, and you will be subdued."

The youth knows perfectly that his family has given all its authority into the hands of M. Demetz, and that if, after the first trial, he again fails in duty, he will be brought back to the *maison paternelle* and subjected to a discipline far more rigorous than before. As the feebleness of the parent is too often the cause of the evil to be cured in his son, M. Demetz says that as soon as the latter is convinced that he can no longer count upon impunity, he performs with promptness and alacrity every duty required of him. It is at the moment when the college vacation begins that the discipline of the *maison paternelle* is most efficacious. When a pupil has been idle through the year, M. Demetz says to him on his arrival, "You have rested while your comrades worked; it is but just that you should work while they rest." More logical than one would suppose, the youth is apt to be strongly impressed by this view, and generally goes to work at once, with ardor, to make up for lost time. M. Demetz promises him that if he applies himself diligently to his studies, he will grant him some days with his family before his vacation ends and he is sent back to resume his place with his fellow-students at college. Fear on the one side, and filial love on the other, cause the inmates of the *maison paternelle* to return to their institutions animated, for the most part, with better sentiments and higher purposes.

For eighteen years the *maison paternelle* has been doing the special work for which it was created. During that time more than nine hundred youths have experienced the wholesome pressure of its discipline, and perhaps—for it has long been well known to the young collegians of France, and has been a terror to the lazy and the vicious—a still greater number have felt the silent influence of its deterrent power. Of the nine hundred who have actually been within its chastening grasp, stern it may be, yet wisely loving, a number, not great in proportion to the whole, have been returned a second time; a very few have thrice made proof of its friendly severity. But the mass have been restored to a right mind and a right conduct by a few weeks or a few

months of its paternal discipline; and the remainder, with here and there an exception, after a second or third experience.

Some sentences were found written on the bottom board of a table-drawer in the room of one of the inmates of the *maison paternelle*, addressed to the person who should succeed him in the occupancy of the room. They appear to have been penned by one who had shown himself rebellious, to a certain extent at least; but they so clearly reveal the good effect of the discipline, even upon a stubborn youth, that I begged a copy of M. Demetz, who kindly caused one to be made for me. I append a translation, which cannot fail to interest the reader.

Reflections found inside his table-drawer after the departure of student No. 112.

Courage, my friend, courage! Expiate your fault, but do not abuse the pardon of your family. Take my advice, which is the result of experience. You will gain nothing by obstinacy, except to be reduced to the necessity of enlisting; it is what I have done. I have enlisted for two years, whereas, if I had listened to my parents, I should still have been happy. For you, at least, there is yet time. Enter at once on the good way; bear cheerfully your punishment, and you may still be happy. Keep my words ever in memory, and think of the unhappy friend who gives you these few counsels before leaving the *maison paternelle*. Work, behave well, and you will one day be happy. It is an old companion in misfortune, on the point of departure, who gives you this counsel. Courage! A friend,

D. M.,

*Former pupil of the College of Tours, in the belles-lettres class;
drummer in the band of said college; enlisted volunteer.*

On the day of my departure M. Demetz had all the colons called in at noon from their farm-work, and had given orders that they should dress themselves in their Sunday attire and prepare for a formal review. No intimation had been given of this, and as we were lingering at the dinner-table, after the repast was ended, I was surprised to hear the enlivening strains of military music. Hastening, as we all did, to the front porch, my surprise was increased as I looked out upon the scene that presented itself to the eye. From the rigging of the large ship that graces the center of the hollow square, around which cluster the cottages of the colony, a hundred flags floated gaily in the breeze; and surmounting all, the colors of France and the United States, lovingly intertwined, waved from the mast-head. So may they ever wave, the emblem of peace and good will, the pledge of a generous rivalry in labors directed to the progress of man in knowledge, virtue, justice, happiness, civilization! Slowly approaching, with measured step and gallant bearing, to the sound of martial music—drum and bugle and clarionet—were seen the hundreds of boys who form the colony, every household with its own standard, each of a different color; the boys dressed in check trousers and blue cotton blouses, with caps and sabots; the musicians leading the column, and the fire brigade bringing up the rear, the latter armed with helmets, hooks, hatchets, and all the weapons used in combating the devouring element. Arrived in front of the mansion, the whole company halted and remained in position, while M. Demetz, with a few others, passed in front of the entire line. The review completed, the column again took up its line of march and made the circuit of the square, when it was disbanded, and the boys separated to change their clothing and return to their accustomed labors; and I, rejoicing in all I had seen, and sorrowing that my stay might not be prolonged, retraced my steps to Tours, and thence to Paris.

§ 15. *Patronage*.—The work of aiding discharged prisoners has not taken root so widely in France as in England, Holland, Bavaria, and, perhaps, some other European countries; but as far as it goes it is well

organized, and eminently successful. This is particularly the case with the oldest association of the kind in France, and possibly in the world—the “Patronage Society for Young Prisoners and Liberated Juveniles of the Department of the Seine.” The conception of that eminent publicist and philanthropist, M. Ch. Lucas, it was organized in 1833, and is, therefore, just forty years old; and it is as vigorous and active to-day as at any period of its long and useful career. A single fact will place in the clearest light its extraordinary success: Prior to the formation of the society, sixty-five out of every hundred of the juveniles discharged from the Roquette relapsed and were rearrested within a few months after their release, and of the whereabouts and destiny of twenty-five more nothing was known; whereas now the relapses and recommittals have been brought down to between five and seven per cent., a result mainly, if not solely, due to the wise and efficient labors of the association. The aim of the society, as stated by its able and accomplished secretary, M. Victor Bournat, in his last report, is: “To save the child who has committed one, or, perchance, several offenses, without knowing their gravity, and who sees all doors, sometimes even that of the paternal dwelling, closed against him; to receive him into a house, which thenceforth becomes his family-home; to provide for him a little outfit of clothing; to find for him a place in some workshop, with a good master, where he may commence or continue an apprenticeship; to watch over him till the moment when he shall become able, by his labor, to provide for himself; to re-animate and support his courage amid the many trials of his new position; to teach and guide him in the discharge of his duties to God, his parents, and his master; to aid him, when he shall have become a workman, in starting a business for himself; to assist him at the moment of his marriage; and, in short, to make of him another master, who shall be ready to receive and help those who, like himself, may have wandered from the path of rectitude.” A noble aim, and nobly carried into effect! As intimated in this extract, the society has a house—a *home*—into which it temporarily receives its wards on their liberation, and fits them out for their career as apprentices. It is a large establishment, well appointed and well kept in all respects, with offices, chapel, dormitories, wardrobe, gymnasium, &c. Here are kept the clothes of all the wards of the society apprenticed in different parts of Paris; here all their washing is done; hither they come every Sunday to replace their soiled with clean garments, and to spend the day in receiving religious and scholastic instruction, in singing, in gymnastic exercises, in social intercourse with each other and with their patrons, and returning at night to the homes of their several masters. Here also they find a home, and a welcome, and all needed care when they are sick or out of employment. A master lately said to M. Bournat: “I take care that the apprentice you furnished me never fails to be present at your Sunday re-unions; he always comes back more gentle, more civil, more industrious.” I passed an hour at this establishment one Sunday morning, and left it filled with admiration and delight at the precious fruit yielded by this charity.

The Protestants of Paris in 1869 organized an association under the name of “Société de Patronage pour les Prisonniers Libérés Protestants,” of which Pastor Robin is the active secretary, a man of large views and large heart, who is thoroughly devoted to this work. He has just issued his first report, which shows good and effective work. So far not more than five per cent. of the society’s wards have relapsed. The members of the society begin their work within the prison walls, where they labor assiduously and successfully to give a right turn to the thoughts and purposes of the prisoners.

PART FIFTH.

LESSONS—SUGGESTIONS—RECOMMENDATIONS.

CHAPTER XXXVIII.

CONCLUSION.

The congress of London was fruitful in important and valuable lessons. I do not propose an exhaustive treatment of this point, but simply, in a single concluding chapter, to offer a few hints toward the inauguration, in the several States of this Union, of a prison discipline more rational, humane, and reformatory, that is to say, more Christian, than has heretofore been, or is now, generally applied in the management of imprisoned criminals.

§ 1. The first thing taught by the congress, and that which lies most upon the surface, is, that principles have a value denied to systems. The congress developed all shades of opinion on the question of systems. It was unanimous, or nearly so, on the question of principles. Mr. Stevens, of Belgium, one of the ablest, most enlightened, and most zealous of the partisans of cellular separation throughout the whole period of imprisonment, and Count Sollohub, of Russia, who holds that the isolation of man, or even the imposition of an obligation of perpetual silence, is a contravention of the divine will, can yet cordially unite—did, in point of fact, unite—in a common declaration of fundamental principles; principles which must interpenetrate and give vitality to every system, or it will remain, cold, dead, barren. The reason of this is obvious. Systems are but methods, processes; principles are living forces. Systems may change, do change, must change, with the climate, soil, territorial extent, manners, customs, institutions, traditions, prejudices of different countries; principles are roots, essences, powers, without which there is neither life nor energy in any organization, physical or moral. Systems are temporary and perishable; principles eternal and indestructible. Systems are human; principles divine. The former have their origin in the wisdom of man, which may err; the latter, in the wisdom of God, which is unerring. Starting with the postulate, in which the whole world is now agreed, that a chief aim of prison discipline is the reformation of criminals, the essential principles which must guide, quicken, and render fruitful this great work, are: That hope must be early planted in the breast of the prisoner, and kept there as an ever living, ever active power; that the prisoner himself must be the chief agent in his own amendment, and that, therefore, his will must be gained to that end, and his active exertions enlisted in its furtherance; that, while physical force is not to be excluded, moral forces must be made prominent, and be substituted for the former in all cases where such substitution is practicable; that the feeling of self-respect and personal dignity must be developed and cultivated in the prisoner to the utmost extent possible, and that, consequently, his manhood must be respected, and all insult and needless humiliation withheld from him;

that religion, education, and labor must be made to contribute, in harmonious combination, their powerful agency toward his moral regeneration; that both the power and the will to work, and so to earn and eat honest bread, when he is discharged from prison, must be imparted to him while he is still in prison; and that society has not done its whole duty to the criminal when it has punished nor even when it has reformed him, but that, after his liberation, it owes him the still further duty of watching over and caring for him; of doing, in fact, all it may, to encourage him, to hold him to his good resolutions, and to prevent his return to crime. These, in altered phrases, are the principles adopted by the congress; principles in which the advocates of all systems united; principles which may be applied, in their integrity and all their regenerative force, under the separate system, the congregate system, the social or the silent system, the system of shop-work or of farm-work. They may be applied, they *must* be applied, whenever and wherever the work of reformation is sincerely and earnestly taken in hand; for they are principles which belong to human nature in every age and every zone. What results? The necessity for a radical and comprehensive change, in a direction to be immediately pointed out. The great controversy, among prison reformers, has been as to the superior excellence and efficacy of the separate system and the associated silent system, of which Philadelphia and Auburn stood forth as the representatives; and the controversy has been waged chiefly on the platform and in the press, through speech spoken or written. Let the locality and the instrument of this controversy now be changed. As regards the former, let the hall of debate be replaced by the prison; and as regards the latter, let deeds be substituted for words. Let the partisans of both systems, of all systems, drop the war of words, and exert all their ability, all their energy, all their skill, all their resources of whatever kind, in broad, hearty efforts to apply the principles, in which all are agreed, to the work of changing criminals into honest men, spoliators into producers, drones into busy toilers in the hives of industry. Let all work in their own way and with tools of their own choosing, unchallenged, unmolested. I, for one, have no doubt that all will show good work. I have my own thoughts as to which will show the best; but I am perfectly willing to abide the issue, and will joyfully cast in my lot with those who are most successful in accomplishing the end, which all desire and all propose, with, I doubt not, equal sincerity and in all good conscience.

Most of us in this country have, I am persuaded, undervalued cellular separation, which is good and useful in its proper place and function. I think it ought to be applied to all the arrested and indicted, imprisoned before trial. I think it may be usefully applied to first offenders as a short, sharp, vigorous notice, and with a view mainly to deterrent effect. And I am equally clear that it should form a first stage in any and all systems for the reformatory treatment of criminals of the higher grades; and that in that case it should be applied with a considerable degree of elasticity, so that it may be made longer or shorter within limits of a far wider range than is given to it in the Crofton system as now practised in Ireland.

§ 2. No reform is to-day more essential to the introduction of a real and effective reformatory prison discipline than such a change in our criminal laws as will do away with constantly repeated short sentences for minor offenses, which are as constantly repeated by the same persons. I need not here repeat what was said in the official reports handed in to the congress from the different countries represented in it; nor what was uttered in debate upon the floor; nor the arguments so well

put in the papers furnished by the Liverpool magistrates and by Mr. Barwick Baker. But one voice came from all quarters, which was, that these ever-recurring sentences of only a few days' or a few months' imprisonment, inflicted scores, yes, hundreds of times, on the same individual for the same or similar peccadillos, constitute an evil of grave character, which requires the early and serious attention of the law-making power. No one put this matter more sharply, and it would be impossible to put it more truly, than Count Sollohub, in his report for Russia, viz, that "not only do these short imprisonments for trivial offenses do no good, but they create criminals by profession." One short imprisonment for such misdemeanors is well, but it should be a sharp and keenly-felt admonition, of a character to be really "a terror to evil-doers;" and with the understanding, very clearly imparted to the culprit, that a second offense, even though of no greater gravity than the first, would be sure to be visited with a far heavier and more prolonged punishment. The sentence should then be made long enough for reformatory processes to take effect; and in this work, time, and a good deal of it, is an essential element; for idle, vagrant, and, in most cases, drinking habits are to be broken up, and replaced by those of steady industry and absolute sobriety; in a word, the whole bent and current of the life are to be changed. If it should be objected that a long sentence is out of all proportion to a trifling offense, the reply is, that is not the point. It is not a question of so much suffering for so much transgression; reformatory prison discipline rises far above such vindictive and retaliatory considerations. It is a question, first, of the effective protection of society, but much more, of *the salvation of the man*; and whatever others may say, the man himself, on whom this saving work has been wrought, will thank you to the day of his death for any degree of kind and wise severity that may have been found necessary to that result.

§ 3. There is a principle of criminal law, not yet accepted by legislators, and therefore not incorporated into the criminal codes, but approved by many of the deepest and wisest students of penitentiary science—practical men as well as theorists, those who have studied that science in the prison as well as those who have studied it in the closet—the introduction of which into our penal legislation would not only meet the objection mentioned in the last section, but greatly facilitate the important reform there suggested. I refer to the imposition of indefinite sentences instead of time-sentences, under which the prisoner would be released only on satisfactory evidence of reformation, and not as the result of mere lapse of time. I have said that some of the best thinkers and workers in this department of social science have given their adhesion to this principle. Among these may be named Hill, Maconochie, and Miss Carpenter, of England; Despine and Bournat, of France; Guillaume, of Switzerland; and Dwight, Sanborn, and Brockway, of the United States. These names are not the symbols of a dreamy fanaticism; they represent calm thought, careful inquiry, cautious and solid judgment; they are names of the highest authority in their respective countries, and some of them are known and influential far beyond the limits of the lands that gave them birth. Dr. Despine goes so far as to say that the application of this principle will become a necessity, whenever a really reformatory prison discipline comes to be generally introduced and pursued in sober earnest. Maconochie's idea was peculiar. He did not propose the imposition of a sentence indefinite in form, but only in operation and effect. This sentence took the shape of marks; so many hundred or so many thousand good marks, to be earned by industry,

studious habits in school, and general good conduct, as the condition of his release. But there was a further peculiarity in his system. In it marks had a financial as well as a moral value. He would give nothing to prisoners beyond bread and water and the roughest sleeping accommodations, except what they earned and paid for. So his marks were made to represent money, as well as progress towards liberation. They were so adjusted that a prisoner, by the utmost diligence and carefulness, the practice of which was thus made to spring from an inward impulse, could earn such a maximum number daily. A certain tale of these, say one-half or two-thirds, must go to supply his bodily and mental necessities, (for even his schooling had to be paid for;) so that only the surplus, the savings, so to speak, counted towards his release. An incidental advantage, of the highest value, is obvious at a glance, as a resultant of this system. It taught the prisoner practically what economizing is, and made him *feel* its necessity and value. He might, if he chose, spend the whole of his marks, that is, of his earnings, as he went along, in which case he made no advance towards a discharge, but became, *by his own election*, a prisoner for life; or he might deny himself many little comforts and luxuries, in which case, on the other hand, the hour of liberty, the sweetest possession of man, was constantly approaching, and that with comparative rapidity. What has thus far been said has been upon the assumption that the prisoner earned his maximum of marks. But there is a further and no less important view. If he was idle or disobedient, and only earned marks enough for his support, he made himself a life prisoner as effectually as if he had earned and expended the whole tale; and always, be it carefully noted, by *his own free choice*. Captain Maconochie was never permitted to apply his system in its entirety; prescriptive ideas and red tape forbade such freedom of thought and action; but the mere shreds of it, which were all he was allowed to employ, wrought, in cases without number, transformations on Norfolk Island which seemed little less than miracles; insomuch that he could say, in words of strictest truth—for the testimony to that effect is too strong and too respectable to warrant either doubt or denial—"I found the island a turbulent, brutal hell; I left it a peaceful, well-ordered community."

I feel strongly inclined to favor this fundamental idea of the Maconochie plan, for it seems to me that very few criminals could come out of such a crucible without being purified and refined, at least to such a degree as to become fair citizens and inclined to live by honest toil rather than through depredations on the community. But Mr. M. D. Hill, who has written most and written best on this question, for he has written with a force of logic which has carried conviction to thousands of minds, and which no adversary has yet been able to meet—propounds the system of indefinite sentences pure and simple, that is to say, sentences terminable only on satisfactory evidence of reformation, never as the consequence of the mere flux of time. However consonant this position may be to reason and natural justice—and I believe the accord to be perfect, since, if the protection of society, as all men hold, is the end of imprisonment and its justification, there is the same reason for keeping as for putting a man in prison, so long as you are morally certain that, if set at liberty, he will go out to prey upon honest people, and rob them of the quiet and the comforts to which their honest toil has entitled them—it is extremely doubtful whether society will, or could, ever become reconciled to so great a change on the sudden as that from determinate to wholly indeterminate sentences. If, therefore, the principle is ever to receive a practical application, it is likely that it must

be under certain limitations; that the courts must assign a maximum to the duration of the punishment, leaving a discretion, greater or less in extent, to the authorities who are charged with carrying the sentence into effect. To this extent the principle is already measurably familiar to the thought and the practice of our own and other countries. It is the principle of all the sentences to our refuges and reform schools for juvenile delinquents, where it is applied with the best effect. It is applied also, though to a less extent—for with us sentences are mostly during minority—to similar institutions in foreign countries, and notably to Mettray, the most successful reformatory in the world for young criminals, where, if I do not mistake, the director has almost unlimited discretion. It exists in all countries where provisional or revocable liberation is practised, under the ticket-of-license system or otherwise. It is found in all those state prisons of our country where what are called commutation laws are in force—that is, laws which allow an abbreviation of the term of imprisonment, to the extent, in some States where the sentence is long enough, of one third or more of the entire punishment, and that without any power of revocation. So excellent is the effect of this remission, granted only as the fruit of industry, obedience, and good conduct, that it is generally regarded as being the greatest advance in prison discipline ever made among us by any single measure. The same principle is applied in the sentences to the work-house on the state farm of Rhode Island, where a term of three years may be assigned by the magistrate for even trivial offenses, while the governing authority, the Board of Public Charities and Correction, is intrusted with the power of releasing a prisoner whenever it may, in their judgment, be done to his advantage and that of the community. The results in this case have not, I believe, been all that was anticipated, but it is thought that the disappointment is due to a faulty administration, the board not having as yet found the right man for the place. This principle was also similarly applied, for a year, to one class of female prisoners in the Detroit House of Correction, under Mr. Brockway, with the most encouraging results; but, unhappily, the supreme court of Michigan decided the law to be unconstitutional under which these imprisonments had taken place; not, however, because of the principle under consideration, but upon some other ground.

So that it is not so much a new principle which is sought to be introduced into our criminal laws and administration, as it is the application, in a more comprehensive, well-adjusted, thorough, and effective way, of a principle already known, and whose value has been, to a certain extent, tested and recognized.

Undoubtedly before it would be safe and wise to give to this principle the wide application proposed, even under the limitations which have been named, some very radical reforms must be introduced into our prison systems; for it would be little less than madness to attempt such an experiment, without officers qualified to undertake it, or an official tenure permanent enough to conduct it to its normal issue.

§ 4. Centralization in every branch of the public administration—that, for example, which embraces prisons, as well as others—may exist in various degrees. It may absorb all power; it may be wisely and duly tempered with local authority; it may be feeble and languid, the local overshadowing and dominating the general; or it may be wholly wanting, with the different parts of the system, like so many separate grains of sand, unconnected by any organic principle or cohesive force of whatever kind.

The last of these propositions describes the state of things gener-

ally—universally, indeed, as far as I know—existing among us. To the best of my knowledge and belief, there is not a State of our Union in which the various institutions looking to the prevention and repression of crime constitute a unit, or even a homogeneous system, held together and administered by a central power. Yet, without something of this sort, it is impossible that broad, thorough, permanent, fruitful prison reforms should take place.

As long ago as 1850, a parliamentary committee in England expressed the opinion, in reference to the county and borough prisons, that "it is desirable that the legislature should intrust increased powers to some central authority;" a reform not yet carried out in that country. Movements in this direction have been begun in several of our States, with more or less breadth of scope, and with varying prospects of success. I look upon it that, in any comprehensive re-organization of the prison system of a state, the creation of a central authority, having general powers of direction and control, is an essential feature. Without some such power, ready at all times for deliberation and action, there can be no consistent administration, no experiments conducted on any uniform plan, no wide generalizations, no establishment of broad principles of prison discipline, no application of such principles in the use of common methods; with it, all these things may be. Nor is such central and supreme authority at all inconsistent with local boards acting in unison with it. But with or without local boards, either a general board or a general superintendent, seems to be essentially requisite, to the end that all the preventive, reformatory, and penal institutions of a state may be molded into one harmonious system; its parts mutually answering to and supporting each other, the whole animated by the same spirit, aiming at the same objects, and subject to the same control, yet without the loss of the advantages of voluntary aid and effort, where such are attainable and of the right kind, and with the co-operation of local boards, if they should be deemed desirable.

England, as before stated, is without such a system, so far as her county and borough jails are concerned, though possessing it in the management of her convict prisons. Switzerland suffers, as we do, from the jealousy and power of local administrations; while in some other of the continental states of Europe, possibly in most of them, centralization is in excess.

§ 5. Another reform, equally essential to a genuine reformatory prison discipline, is the elimination of partisan politics from the control of our prisons, and the creation of a permanent administration for each. There is scarcely a State—Pennsylvania is probably the most conspicuous exception—in which political influence is not the dominating power. Too often the prisons constitute a part of the political machinery of the State, and, in their management, the interest of the convict and the community is sacrificed to the interest of the politician. This is the bane of our penitentiary systems. It lies at the root of most of the evils connected with them, and, in particular, it is the cause of that instability in the tenure of office and want of permanence in the executive administration, which render improvement difficult and perfection impossible. The utility of party politics is freely acknowledged. Within its proper sphere it has a generous and noble function. But there are things which it touches only to mar. Religion is one of these; education is another; and surely the penal institutions of a state form a third, since they combine the characteristics of both, being at once, if they are what they ought to be, religious and educational establishments.

An article framed by the Prison Association, of New York, was in-

incorporated into the amended constitution of that State by the convention of 1867. The constitution, as a whole, was rejected by the people, and the prison article fell with the rest. At the session of the legislature following that rejection, it was offered in the form of a joint resolution, recommending its adoption to the people of the State, and passed the senate by a unanimous vote, but failed to receive the action of the lower house. The next winter it passed the senate again, with one negative vote, but was rejected by a small majority of the assembly. On the third trial, at the subsequent session, it passed both houses. It must receive a second affirmative vote by the legislature, with a new senate as well as assembly, after which it goes to the people of the State for their suffrage. There is little doubt that the popular vote will be favorable. But would its adoption be a reform? I think so; and one of the highest value to the cause of prison discipline in New York, and, through the great influence of that State, in the whole country. It creates a board of five prison managers, to be appointed by the governor and senate, and to hold office for ten years, one vacancy to occur every two years. This board is to be put in immediate charge of the State prisons, and to appoint the principal officers, viz, warden, chaplain, physician, and clerk, but to have no power of removal, except for cause, stated in writing, and after a fair hearing, that is, on impeachment. The warden, being responsible for the state and discipline of the prison, and to be held rigidly to that responsibility, is to have the sole power of appointment and removal of his subordinates, the agents who are to execute his will; subject, as a matter of course, to his general responsibility to the board. The managers are to have no salary, but are to appoint a secretary, who will, it is understood, receive a compensation that will command the very best talent in the market. The board is invested, by the proposed article, with no direct power over the other pena or reformatory institutions of the State; but, as the intention of its framers was to make, ultimately, the whole system a unit, it provides that the said board shall possess such powers and perform such duties in regard to all the other penal and reformatory institutions of the State as the legislature may from time to time direct.

From the above statement it will be seen what an immense advance would be gained to prison reform by the incorporation of the proposed amendment into the constitution of New York. The administration would be at once lifted out of the slough of politics, and made absolutely permanent, except in cases where incompetency or malfeasance should make the removal of the head necessary to the proper government and efficiency of the prison committed to his charge. At present the state of things is, almost everywhere in our country, quite the reverse of this. Both appointments and removals are made on party considerations chiefly, if not solely. Men are inconsiderately placed in office without reference to their fitness; and they are remorselessly removed from office as soon as they have learned—often before they have learned—their duty. Can it be expected that we should have effective service on such conditions? Can it be expected that men will do their duty efficiently and honestly, who know that, despite their utmost diligence and fidelity, next week, or next month, or next year, their places will be taken from them and given to others? Would mercantile houses, would banking and insurance companies, would railroad corporations, be willing to employ their agents on this plan? To ask such a question is to answer it. We complain of the inefficiency and corruption of our prison officials; yet we could not devise a scheme of administration better adapted to produce these evils than the one actually employed. Would not men be

almost more than human who, under such circumstances, would do their duty faithfully and effectively?

Happily, the prison systems of the Old World are not burdened with this weight nor impeded by this obstruction. I made special inquiries upon this point, and satisfied myself that there is not a country in Europe in which political influence is felt as an evil, so far as prison administration is concerned. Nor was there anything so incomprehensible to gentlemen connected with prison affairs in those countries as this state of things among us. It was a perpetual wonder to them that anything could be accomplished in this department under such circumstances, and especially that so much good work could be done as they freely gave us credit for.

§ 6. The machinery of our penal systems, if that is the right word by which to represent the series or classes of institutions designed to effect a diminution of crime, stands in urgent need of re-adjustment and reform. As this branch of the general question lies in my mind, the series should embrace five gradations, to wit, preventive institutions, juvenile reformatories, county jails, houses of correction, and state prisons, with appendages to each of the two last named, having the general character of the Crofton intermediate prison. It will be necessary to compress what I have to say on each class into a narrow compass. Before proceeding, however, to sketch the system, a single preliminary observation may be excused. It is this: As a preparatory step, laws ought to be enacted by which the education of all the children of the State should be made compulsory. It is far better to force education upon the people than to force them into prisons to pay the penalty of crimes, of which neglect or ignorance has been among the chief causes.

a. Preventive institutions, strictly so named, are the first in the series. We enter into life with various proclivities, which may be developed and molded to virtue by education and the good examples and salutary influences of home. But to what dangers are those exposed who lack these advantages? And what multitudes of children, neglected or abandoned almost from the cradle, are deprived of them, and hence are exposed to all the fatal consequences of that deplorable condition. If their first steps in the world are marked by a violation of the laws of society it is, most frequently, because they have no knowledge of those laws. Not a few of these unhappy beings never knew, and will never know, to what parents they owe the light. One-fifth of them are orphans in the full sense. Half the remainder have lost their father, a fourth part their mother; and nearly all who have known a family have been dragged by it, either through example or direct incitement, to vice and crime, so that, in their case, the family relation is actually worse than orphanage. These general statistics, which are repeated from year to year, in different states and in all countries, afford a full explanation of the precocious wickedness of these unfortunates, who are, in some sort, devoted, driven to crime by the circumstances of their birth or by their early surroundings, so that society, which lays its strong hand upon them the moment they disturb its repose, punishes them, in the greater number of cases, for faults which, in reality, are not theirs; faults for whose commission society itself, which inflicts the punishment, has a grave responsibility—graver than, perhaps, it is aware of, or is willing to admit; for, if it had been awake to its duty and been wise, it might have prevented these violations of its laws at a cost far less than it is obliged to incur in punishing them. It is precisely at this point that the proposition comes in—may I not say, that the *duty* presses itself upon the public conscience?—for the establishment of preventive institu-

tions, by whatever name they may be called— orphan-asylums; news-boys' homes; industrial, truant, or ragged schools; children's aid associations; juvenile asylums, homes for destitute children, &c., &c. Institutions of this sort should be multiplied tenfold, a hundred-fold, throughout the length and breadth of the land. Into them should be gathered, to the last one, the children of whom I have spoken—fatherless, motherless, homeless, or worse than either, because their homes are but schools of vice, with the parents for teachers!—into these shelters and retreats should they be gathered to receive that mental, moral, religious, and industrial training, not otherwise attainable by them, and thence to be sent out, in due time, to good places on farms or in the workshop, where they would grow into virtuous and useful citizens, adding to, instead of preying upon, the productive industry of the country. I could wish for time and space to develop the ideal of such institutions, as it lies in my thought, but can only, in the most general terms, express the opinion that all the arrangements in them should be such as to cultivate industrious habits and prepare their inmates for the stations they are afterward to fill. The kitchen, the wash-tub, the sewing and knitting room, the workshop, the farm, and, above all, the school-room, together with such recreations as may be suitable to their years, should occupy the time of those who find a home there; and this home should be, though tidy and attractive, yet of the plainest character, the counterpart, as near as may be, of the homes of farmers or mechanics in moderate circumstances, such as they themselves will be likely to have when they become fathers or mothers, with households around them.

Is the expense of such establishments made a point of objection? I will reply to the objection by a short relation. In every district of Sweden, a country far advanced in her school system, there is an officer called the "persuader," whose duty it is to look after children without family, or whose parents are in prison. Those whom he *persuades* (and his methods, it may be believed, are somewhat summary as well as potent) are placed in special schools, where, instead of pests, they become useful members of society. An Englishman, visiting Sweden, asked a Swedish gentleman whether the care of the children picked up in the streets and highways was not costly? The answer was: "Yes, it is costly, but not dear. We Swedes are not rich enough to let a child grow up in ignorance, misery, and crime, to become afterward a scourge to society, as well as a disgrace to himself." There is a whole volume of fact and philosophy in that curt reply. There can be no doubt that a judicious system of *prevention*, such as here proposed, would be the highest economy, for it would cut off the most copious source of adult crime, and thus effectually stop an incessant and tremendous drain upon the wealth of the state.

b. The next class of institutions in the series is the juvenile reformatory, intended, not like the preceding, for children and youths who are in danger of becoming criminals, but for those who have actually committed criminal acts. The constitution and design of this class of establishments are so well known, and their management, for the most part, so excellent, both in our own and other countries, that it is quite needless to enlarge upon them. All that I deem it necessary to do—and in this I would place the highest possible emphasis—is to urge their establishment in States where they do not now exist, and their multiplication in all. Most European countries are far better provided with them than we are, while in our extended territory and unprecedented demand for labor we have advantages denied to them for dis-

posing in a hopeful manner of those who have been made the subjects of their discipline.

Establishments appropriated to *young prisoners* are, beyond all contradiction, the leading point in every penitentiary system. To reform the criminal masses, it is with childhood that we must commence; it is to the fountain-head that we must apply the purifying agencies. We too often forget that it is these insubordinate and perverted children who, at a later period, will form the generations of adult transgressors whose crimes will disturb and terrify society.

It seems to me that there is great need of a class of reformatories or juvenile prisons for boys and young men too old for the ordinary reformatory, yet too young for the state prison, though guilty of crimes ordinarily punishable by sentence to that class of prisons. An institution of this kind, called an industrial reformatory, is now in process of construction at Elmira, New York. This experiment is of the highest importance to penitentiary science, and its progress will be watched with a lively interest by the friends of prison reform in this and other countries.

c. The third class is the county jail. I have no hesitation in declaring the county-jail system of the United States a disgrace to our civilization; and there is no department of our repressive agencies in which the hand of reform is more imperatively needed. The great evil of the jail system is the promiscuous intercourse of the prisoners with enforced idleness, there being, in general, no classification, except that which results from an imperfect separation of the sexes, and no labor at all. From this unchecked association and want of employment it results that our jails are but schools, maintained at the public cost, for instruction in vice, and for providing an unbroken succession of thieves, burglars, and profligates. The stripling who has been committed for vagrancy or some trifling offense, locked up without employment in company with accomplished villains as idle as himself, listens to their narrative of crime till he pants for the hour of liberty, that he may commence the same bold and, to his childish imagination, brilliant career.

The county jail is now made not only a place of detention for prisoners awaiting trial, but a place of punishment for minor offenses, to which persons are sentenced for periods varying from a day to two years, and that so repeatedly that many get the name of revolvers, on account of the frequency with which they come back. This class of prisons should, in my opinion, be limited in its functions to two classes of prisoners, viz: 1. Persons under arrest and awaiting the preliminary hearing, or under indictment and awaiting trial. 2. Persons undergoing their punishment for a first offense. Both classes should be subjected to the strict cellular régime; the first because their punishment, as already explained in a former section, should be made strongly deterrent, a real intimidation, and, therefore, should be undergone in a separate ward; the second, for reasons to be immediately explained.

It is a principle of criminal law that an accused person is to be presumed innocent until he has been proved guilty. While there can be no doubt that society has the right to subject its members, under certain circumstances, to preliminary detention, it is as undoubted a corollary from the principle just stated that the exercise of this right ought never to take on a penal character, and that the accused himself must be protected, as well as the interests of social order. The sole object of such preliminary detention is to prevent escape and the possible defeat thereby of the ends of justice; consequently it is but a precautionary measure, which leaves untouched the ultimate question of guilt. It follows that

the person of the accused is a deposit, confided to the magistrates pending the decision of that question, to be returned to society, if he is proved innocent, as pure and sound as when received. Hence all the care and consideration due to innocent citizens must be accorded to these persons, so long as the presumption of innocence remains in their favor. Hence, too, it follows that the accused and the convicted should receive a treatment materially different the one from the other, and that the prison for detention should be quite another thing than the prison for punishment. The Roman jurisprudence long ago distinguished between the accused and the convicted, calling the former the *hostage of justice*, the latter the *slave of punishment*. It also distinguished between the places in which they were detained, naming the prison of the former, *carcer*; that of the latter, *vincula publica*; and distinctly declared that the *carcer* was to be regarded simply as a place for detaining men, keeping them safely, and not, like the *vincula publica*, for punishing them. The supreme conclusion from this argument is, that persons under a charge of crime, and while that charge remains still unproved, have a right to be protected from all danger of contamination by their fellow-prisoners, many of whom, no doubt, are guilty; and this protection can be had only through cellular separation. Even if the accused himself is willing, or indeed anxious, to forego this protection, society owes such guardianship to itself, for it cannot afford to have its members corrupted when it is in its power to prevent it. Another consequence flows from the argument; it is that, except the deprivation of liberty, nothing in these places of detention ought to be made to assume the aspect, the forms, the afflictive austerity of the prison. The accused ought to enjoy in them all the moral and material comforts that are consistent with their safe custody.

Permanency in the administration of county jails, as of all other prisons, I regard as a matter of the highest importance. To this end, where contiguous counties are small, or the population sparse, it might be well to have two or more counties unite in the maintenance of a jail. This would economize the expenditures, as well as facilitate the change suggested from an ever shifting to a permanent administration.

d. Next in the ascending series would come a class of institutions occupying a position between the county jail and the state prison. This kind of prison is not at present numerous in the United States, although, properly organized and conducted, it would be, in some respects, the most important of all, especially since, if multiplied to the extent it should be, it would be the most numerously peopled, and its occupants would be, for the most part, a class of criminals less steeped in crime than the population of the state prisons, and therefore more open to reformatory influences. The few that are now found among us are called by various names, but the designation which seems most fit, as best expressing their nature and design, is that of House of Correction. They would receive, for the most part, those misdemeanants who now have their punishment in the county jails, though with the criminal laws so changed that, after a first offense, which would still be punishable in the county jail, the sentences would be made long enough for genuine reformatory work to be wrought upon them. A number of these houses of correction, greater or less, according to territorial extent and population, would be needed in every State. They should be dispersed through the State, at points as convenient as possible to the several counties for whose use each is intended.

The advantages to be expected from the general establishment of this class of prisons are: 1. The organization of each with a full staff of

officers, and with all other appointments necessary for an effective performance of the work assigned them. 2. The arrangement of buildings, cells, workshops, school-rooms, chapels, and the entire premises, in a manner suited to a complete penitentiary system. 3. The introduction of a comprehensive, well-adjusted system of industrial labor. 4. Diminished cost of maintenance, despite the increase of officers—owing in part to the earnings of the prisoners, and in part to greater economy in the administration. 5. The relief of the common jails by the absence of a large proportion of their worst inmates and those returning most frequently, which would make the separate imprisonment of the rest comparatively easy, and might even enable several counties to unite their jails into one. 6. The relief of the State prisons by punishing in houses of correction the younger criminals, and perhaps some others, in whose cases extenuating circumstances may have appeared, and in reference to whom good hope may be entertained of benefit from the discipline of the house. 7. The crowning recommendation of the system lies in the reformatory character to be impressed upon it. This, indeed, is the great point to be sought through its establishment. But the complete and effective introduction of a reformatory discipline into any prison system makes exceedingly desirable, if it does not necessitate, the accompaniment of the Crofton intermediate prison. To avoid repetition, however, the treatment of this point will be postponed till the subject of state prisons comes to be considered, when some hints will be given touching the application of the principle to houses of correction.

e. Next and last in the series of establishments composing the prison system is the state prison proper—called in England convict, and on the continent central, prisons—the receptacle of criminals convicted of the gravest offenses against society and its laws, which are punishable by imprisonment, and not by death. It is here, as I conceive, that reforms the most material are needed. Even supposing the system, in its substratum, to remain unchanged, still important modifications are required to bring our state prisons into harmony with the true design of a penitentiary system, considered as an agency for reforming fallen men and women. A complete separation of their government from party politics; permanence in their executive administration; the employment of well-qualified officers; the abolishment of the contract system; the organization of convict labor on a principle which, in seeking to make the prisons self-supporting, will seek still more to make their industries an agency in reforming their inmates, and in restoring them to society masters of a trade that will enable them, on their discharge, to earn an honest living; a broader moral and scholastic instruction; a wider use of rewards to industry and good conduct, so that the principle of hope shall be made to act with greater vigor than that of fear; and the making of the reformation of the prisoners the real, as it is admitted to be the proper, aim of the discipline. Such are the essential reforms needed in the system, supposing it to continue, in other respects, what it is at present.

But I am not satisfied with the system as it is, nor should I be even with the reforms indicated in the last paragraph, for there are other reforms needed to give even to these their full vigor and efficiency. The fundamental reform required is, in my judgment, the introduction and efficient application of the principle of progressive classification, worked, in successive stages, on some well-considered mark system. Three stages would seem to be essential to the best and most effective working of this plan: the first strongly penal, to be undergone in

cellular separation; the second less penal, but still distinctly partaking of that character, yet becoming gradually less and less so, on the prisoner passing from class to class, as successive promotions are earned; while the third should retain but little of the penal character, being intended partly to test the reality of the reformation effected in the two preceding stages, and partly to train the prisoner for a time before his discharge, under conditions similar to those of ordinary free life, and so facilitate his re-absorption into the ranks of honest industry. This would place the prisoner's fate, during his incarceration, to a great extent, in his own hands. It would enable him, through industry and good conduct, to raise himself, step by step, to a position of increased freedom and privilege, while, on the contrary, idleness and disobedience would keep him in a state of coercion and restraint. This would place the springs of conduct within instead of without, and make him act from an inward impulse rather than from the application of any external force. It would effectually enlist his own will in the work of self-improvement, which I look upon as an essential condition of his reformation, for how is it possible to change a bad man into a good one against his own consent? Virtue is an outgrowth. It cannot be forced upon a man, but must spring from a germ planted within, to be developed and brought to perfection, by the assiduous care and nurture of the man himself; on this condition, and no other.

The system thus briefly sketched is, for substance, what has been heretofore known as the Irish, but is now generally, as of right it should be, called the Crofton system, from the name of its founder; and this last stage is his intermediate prison, so named because it holds a middle ground between an imprisonment strictly penal and an imprisonment differing but slightly from the condition of freedom complete and entire. It is essentially a probationary stage, its supreme aim being to *prove* the prisoner, and so to be enabled, if the trial turn out satisfactory, to give to an employer needing his services the requisite guarantee of industry and trustworthiness.

Here we touch the very heart and marrow of the question. The problem is, how to effect the re-absorption of reformed criminals into virtuous society? An army of convicts is every year discharged from prison. Society distrusts and refuses to employ them, thereby compelling a return to crime, and augmenting by its injustice the evil which it aims to cure by its punishments. How can its distrust be conquered, work secured to the convict, his salvation assured, and crime, as the resulting consequence, diminished? There are just two elements in the solution of this problem, and both, I think, essential—the reformation of the convict and a guarantee of his reformation that shall be satisfactory to the public. The reformation is to be effected by the processes—industrial, educational, and moral—to which he is subjected during his imprisonment. But the needed guarantee—how is that to be had? How is the moral cure of the prisoner to be *tested*? For a test there *must be*; it is indispensable. The discharged convict, though reformed and resolved to live honestly, fails to get work; and he fails so generally, that failure is the rule and success the exception. Why is this? It is not that society is hard-hearted; that it has no sympathy with misfortune; that it is vindictive and cruel; that it tramples upon a man merely because he is down. Far from it. But society has no confidence in the liberated prisoner; and, what is more to the purpose, it has no guarantee for its confidence. It is the want of a guarantee that builds a wall of granite between the released convict and honest bread. Conquer the distrust of society, replace it with confidence, furnish the re-

quired guarantee that the man is *trustworthy*, and all difficulty will vanish. Every shop, every factory, every farm, every avenue of honest toil will be open to his entrance. But the question is, how to abate the prejudice felt by society toward the liberated prisoner; how to overcome its dread of him; how to allay its fears; how to win for him its confidence and conciliate its regard? There is but one way to accomplish this result. The convict must furnish proof, during his imprisonment, that it is safe to trust him; safe to put him at the work-bench; safe to place in his hands "the shovel and the hoe;" safe to admit him to the fireside and the home-circle. In other words, his cure must be tested before he is discharged. But I do not see how this can be done where the system is one of material isolation to the end, nor any more how it can be done where the system is one of moral isolation to the end. There must be some field, some opportunity, for the trial. But such a theater, such a chance, can be afforded neither by the separate nor the associate system, as generally conducted. Both systems must be in part retained, in part discarded, in part changed. They must be so modified that the passage from imprisonment to freedom shall not be, as heretofore, by a single bound. The change must be so adjusted that the former shall gradually, almost imperceptibly, melt into the latter. The system must be such that the latter part of the imprisonment shall be little more than moral, in which, as far as may be, all the arrangements shall be those of ordinary life, with its trusts, its temptations, its motives, its responsibilities, its victories over self and sin, its silent toning up and strengthening of the whole character by the friction to which the man is, in these various ways, subjected.

Our state-prison systems should be so organized as to have connected with each prison, in one form or another, the substance of this intermediate establishment, this stage of comparative freedom and of natural training, which, at the same time, prepares the prisoner for full freedom, and tests his fitness for it.

But how can this stage be applied in the case of prisoners committed to the houses of correction? These would scarcely be large enough to warrant the establishment of an intermediate prison in connection with each. A single establishment of this kind would probably be sufficient for most States, but if the State were both large and populous, two or three might be necessary. The English convict establishments have not yet added the intermediate prison; nor does it exist in connection with the system of county and borough jails, either in England or Ireland. An eminent English philanthropist, Mr. Barwick Baker, is so impressed with the importance of the intermediate prison in connection with the English county and borough jail system, that he proposed, four years ago, a plan for making an experiment in that direction, and proffered his services to conduct the experiment himself. Mr. Baker is a gentleman of large wealth and high social position, as well as of great intellectual and business capacity, all of which are devoted, with incessant and tireless zeal, to the promotion of reforms in every department of social progress, but more especially to the work of juvenile reformation and the improvement of prison discipline. He established, I think, the first juvenile reformatory in England—certainly one of the first—and, at his own cost, conducted it for a number of years in person, and has maintained it ever since; his eldest son, upon whom the father's mantle appears to have fallen, acting at present as superintendent. Nor has he only been acquainted, for at least twenty years, with reformatory work, but for a still longer period he has been, as a magistrate and visiting justice, conversant with the management and character of adult

criminals. These facts are stated to show that it is not as a mere amateur, still less as a sciolist, that Mr. Baker speaks; but as a gentleman of large experience and calm judgment, whose opinions, on that account, are entitled to the highest respect. Mr. Baker commences the statement of his plan with a citation from a late report of the inspector of reformatories, in which that officer declares that, on the occurrence of certain changes which he recommends, a considerable number of these establishments might be given up. In that case, Mr. Baker says that he would propose to have the boys in his reformatory removed to others, and that the Home Office accept the buildings and land as an intermediate prison or house of correction. The secretary of state for the home department having full power to remove a prisoner from any one prison to any other, and to send him back at pleasure, Mr. Baker proposes that a few of the best men in the jails of his own and the neighboring counties be *allowed* to petition the secretary to remove them to the intermediate prison for such time only as their conduct proves to be satisfactory. Their petition should state that they had had the rules of the new prison read to them, and that they understood and agreed to the terms of their removal. If the secretary granted the petition, and the prisoner conformed to the rules and worked with earnest good-will on the farm, he would continue there for the remainder of his sentence; if otherwise, he would be sent back to the jail. Nor could he complain of this re-transfer as a hardship, since it would be but a return to his original sentence, to which he had made himself justly liable by a violation of the conditions on which his first transfer was granted. Those who remained through their whole term would then return to the kinds of work on which they had been lately employed, and to habits and a manner of life not unlike those which they left behind them. If a man's release occurred at a season of the year when employment was scarce, (a matter of much importance, if care be had for the diminution of crime,) he should be allowed to remain at the house till work could be found for him. So far, Mr. Baker says, no new legislation would be required. But if the system, on trial, proved a success, it would become necessary to secure the passage of an act authorizing the release of the prisoner on license, to earn his living under the watch of the police. Such license would not be a pardon, but simply a permission for a man to earn his own living during good behavior, revocable at any time for any kind of misconduct, even for being for any considerable time out of work, and so without visible means of support. The great objection to placing criminals in an intermediate prison without walls is that they would be likely to escape. To this Mr. Baker replies that he well remembers the time when the greatest pains were taken to search prisoners, even to the frequent unripping of their beds, to prevent the possible secreting of a nail with which the cell-door might be opened, or of a scrap of iron which could be sharpened into a knife. The safety of the jail was supposed principally to depend on this sort of care and watchfulness. But every prisoner now has a knife in his cell; yet escapes of violence are much less frequent than in those days. So Mr. Baker takes notice that twenty years ago, if it had been proposed to keep a number of boys imprisoned in a field with common hedges round it and public foot-paths running through it, the person so proposing would have been thought little short of a lunatic; yet this system has proved a decided success. Mr. Baker claims to have had, and certainly has had, large experience of men and boys, and he declares that he has no doubt that men would be far more easily restrained with-

out walls than boys have been, for the reason that they commonly act more upon reason and less on sudden impulse.

I have cited this proposition of Mr. Baker at some length, not because it is applicable, in all its phases and details, to the case in hand, but because it contains the judgment, on the general question, of a man of cool and cautious intellect and of a half century's observation, and more particularly because of the important opinion, expressed in the last sentence, as to the greater ease with which men, as compared with boys, might be held under restraint by moral forces.

§ 7. A paper of great value, on the "Capitalists of Crime," was submitted to the congress by Mr. Edwin Hill, who has for many years made the study of this subject a specialty. An analysis of this paper has already been given in the second part of the present report, which treats of the work of the congress. But the subject is one of so much importance, and to which so little attention has heretofore been given, that it seems to me worthy of still further elucidation, and especially that it should have a place in this chapter of "suggestions."

The contest between those who work and those who plunder is nearly as old as the world itself. Nor is there, I fear, much ground to hope for its speedy termination. It is worth while to inquire whether society has not made a mistake in its mode of carrying on this contest. Has it not failed to recognize the fact that habitual criminality is a craft, not carried on solely by isolated individuals, but by a virtual, if not a formal, organization, comprehending various grades and divisions of work, and requiring the combined action of capital and labor just as other crafts do, and being, like them, too, dependent for its continued existence on this union? There are two well-defined classes enlisted in criminal operations, the capitalists and the operatives, those who furnish the means and those who work the machinery; and the former are absolutely essential to the latter. The crime-capitalists include at least four classes: 1. The owners of houses and dens, affording to criminals habitations and places to which they may resort for carousal and low enjoyments. 2. The receivers or purchasers of stolen goods. 3. The pawnbrokers who lend money on such goods. 4. The makers of burglarious and other instruments used in criminal operations. It is, to a great extent, the practical impunity of these capitalists which supports the breed of thieves, burglars, and counterfeiters. As the law now stands, a man possessed of some capital may, with absolute impunity, use it in providing homes for criminals, arranged, if he so please, for concealing the thieves and their plunder, and for baffling the pursuit of the police; or he may, with equal impunity, engage in the manufacture of burglars', thieves', and counterfeiters' instruments, some of which are required to be of elaborate construction and workmanship. It is true that as regards those who cash the stolen property, either by purchase or by loan—receivers and pawnbrokers—the law does provide for their punishment; but the requirements as to evidence are such as to make detection and conviction, in ordinary cases, all but impossible. No doubt the criminal capitalists, compared to the swarms of operative plunderers, constitute but a small class. But being more sensitive to the terrors of the law, and more confined to given localities, they offer by far the fairest mark for criminal legislation. The mere operative of the criminal class has neither reputation to hazard nor property to lose; he can hide himself, or run away. Not so, however, the man who has invested his capital in aid of the predatory class. He cannot conceal himself; and if he abscond, he must leave his house, his shop, or his stock behind him. These crime-capitalists present a vital and an exceedingly vulnerable part of

the organization. If it were made absolutely unsafe for owners of property to afford shelter to habitual criminals—the stern rule, “no house-room to the dishonest,” being rigidly enforced—and if it were also made equally unsafe either to purchase stolen property or to advance money upon it, the class that now lives by plunder would be driven to honesty or starvation. Some years ago, in the town of Kidderminster, England, it was noticed that while more bulky articles were perfectly secure from depredation, the silk and thread used in bombazine and carpet weaving were constantly stolen. Now, what was the cause of this strange anomaly? Not, surely, that the people were honest for one thing and dishonest for another. But this was the reason: Kidderminster was not large enough to harbor a trader in stolen goods of the ordinary kind; but it contained many small weavers, some of whom had both means and inclination to buy the stolen silk and thread. Circumstances enabled capital and labor—the capital of the small weaver and the labor of the thief—to act jointly against the silk and thread, while they did not admit of such joint action against other kinds of property. There is a world of instruction in this. It says to society, Strike at the *crime-capitalist* in your warfare against crime; make the cities too hot to hold him; destroy opportunity in the large towns as well as in the small; and then evil inclination will remain dormant and undeveloped in the former no less than in the latter. But so long as, through ignorance or fear, you fail to adopt this method of attack, you will be obliged to maintain an army of policemen to check evil inclination as it ripens into crime; your property will be exposed to plunder and your persons to injury; and thousands upon thousands of children, who might have been saved, will be doomed to grow up under influences which will compel them, by a law as inexorable as that which makes the magnetic needle obey the lodestone, to become the criminal army of the future.

Now, of what has been said, this is the sum: To the spoliation of property, the united action of capital and labor is essential. Habitual criminality is sustained by an alliance between these two elements, each being alike indispensable to the prosecution of the business. The crime-capitalists are few; the operative plunderers many. The law strikes at the many operatives, one by one; it might and should strike at the few capitalists as a class. Let it direct its blows against the connection between capital and labor, ordinarily a beneficent one, but in this case evil, and only evil; nor forbear its assaults till it has wholly broken and dissolved the connection. When this baleful union shall be pierced in a vital part, it will perish. When the corner-stone of the leprous fabric shall be removed, the building itself will tumble into ruins.

§ 8. A large number of persons, in this country and in all countries, are every year arrested on suspicion and committed to prison, where they are confined for longer or shorter periods, varying from a day to a year, and even more, who, nevertheless, either on their first hearing or their trial, are acquitted by the magistrate or the court, and liberated as not guilty of the crimes charged against them. Yet, I am not aware that anywhere the persons so arrested, so imprisoned, and so adjudged to be innocent, receive any indemnity for the loss of time to which they have been, if not unjustly, at least without any fault of theirs, subjected. On this state of things, the question arises, Is not personal liberty a right as respectable as the right of property? And if this question is answered, as it must be, in the affirmative, a second instantly arises, viz, Is it not the plain duty of society to indemnify the innocent citizen, whom it has imprisoned, for the loss of time thus occasioned, as it indemnifies the citizen from whom it has taken his house or his field for some public use?

The right of indemnity, in this latter case, is not only fully recognized, but guarded with a jealous care. The state wants a part or the whole of my land for some great work, whose execution is demanded by the public good. Yet it can take possession only after various and solemn formalities. My right of ownership is guarded at every point and at every step; and I can be finally dispossessed only on receipt of full value for that of which I am deprived. I am found under circumstances which induce a suspicion, possibly a very slight one, that I have committed a criminal act. The state causes my arrest, and shuts me up in prison. It holds me there one month, six months, twelve months; and then, by the mouth of its chosen agents, solemnly declares that I am not guilty of the crime of which it had, or thought it had, reason to suspect me, and consequently lets me go free. That is all the state does. But is that the state's whole duty? Am I not as much entitled to indemnity in this case as in the other? The state thought I had done wrong, but was mistaken, and has made public and solemn declaration to that effect. Ought she not to repair the loss of time caused by her error? It is impossible for her to make good other and graver losses. "A man is accused, (I cite the words of an eminent French publicist, Mr. Mathieu;) some appearances are against him; and, though the presumption of innocence protects him, he is arrested; he is torn away from his home, his family, his affairs; disorder and trouble are introduced into all his relations; a deadly blow is given to his credit; and he is exposed to a ruin which he might ward off if he were at liberty, but which his imprisonment renders inevitable. Not only has this man suffered all the pains which have just been described; not only has he seen, without being able to apply a remedy, disorder and ruin invade his business, but it is in vain that an order of the judge, or even a decision of the tribunal, annuls his imprisonment and breaks his chains. The preliminary detention has marked him with an indelible stigma; the suspicion, in virtue of which justice has laid her hand upon him, follows him like his shadow, and his reputation will not be cured of the deadly wound it has received. Yet it is not the prisoner who is most to be pitied. How can we fail to turn our eyes toward his wife, his children, his family, though innocent, yet smitten with the same blow, ruined and disgraced like himself, without a fault that can be laid to their charge? Is this justice? Can society so crush the individual in the name of the general interest?"

Surely the principle of indemnity lies wrapped up, as the acorn holds the oak, in this eloquent denunciation; rather, let me say, this irrefragable logic. Not, indeed, complete indemnity, for money is not equal to that function, but indemnity for the time spent in prison. This principle is applied every day in similar cases. The witness and the jurymen, summoned from the work-bench or the counting-house to the courtroom, receive each a piece of money for the loss of time thus incurred. To one of them, who makes, perchance, his hundreds a day, it is but the symbol of justice, a token of the mutual relation between the citizen and the state; to the other, it is the daily bread of himself and his family. Can any reason be assigned why the same principle should not, nay, must not, be applied in the case of the man whom the judicial authority itself, speaking from the seat of justice, has declared to have been imprisoned and "held in durance vile" without adequate cause? Two incidental advantages, of no inconsiderable moment, additional to that of meeting a demand of justice, might be expected from the introduction of this principle into the administration of criminal law, viz, greater caution in making arrests, and more speedy trials after arrest.

Well and eloquently, in a paper on this subject prepared for the Cincinnati congress, has Mr. Corne said: "Man is not yet valued at his just price. The resources which he is capable of developing are far from having attained their maximum of force. Henceforth, without danger of being considered utopian, we may demand for him a portion of that respect with which mere property is surrounded. It is in this view that we claim that no prisoner, judicially recognized as innocent, shall be restored to his liberty without indemnity for the injury he has suffered as a consequence of his unjust imprisonment."

§ 9. The identification of prisoners who have been previously convicted, is a matter of the highest importance in the administration of criminal law; but, unfortunately, no well-devised plan for attaining this object with certainty exists, so far as I know, in any of the States of our Union. Hence the statistics of relapses and recommittals among us are vague and unreliable in the extreme; nothing could be in a more unsatisfactory state. Much use is made of photography in England and Ireland, and the same is true of several of the continental states. But the most perfect scheme for securing trustworthy knowledge on this point is the criminal registers (*casiers judiciaires*) devised by Mr. Bonneville de Marsangy, a French jurist of great eminence, who has lived to see the remarkable success of his invention in his own country, where it has been in use for some fifteen years or more, and its adoption in many others—Italy, Portugal, Denmark, &c. The first Napoleon, the greatest organizer of modern times, desired that his minister of justice should have always at hand "the biography of all malefactors;" a most natural wish, since of all the elements of a judgment as to the moral curability or incorrigibility of an offender, the most reliable is a knowledge of his past, and particularly as that past may have been connected with the administration of penal justice. This is precisely the knowledge which the criminal registers give concerning every man in France, who has ever felt himself within the grasp of the law. The registers are an administrative agency, with whose organization and workings, on my first visit to France, I was more desirous of becoming acquainted, from personal examination, than almost any other. Hence, learning that they were to be seen in the court-house (*palais de justice*) at Saint Omer, the first town I visited in France, that venerable structure received very early attention after my arrival. I found the *casier* to be an immense case, resembling a cupboard or closet, covering the whole side of a large apartment in the building, called the registry. The case contained rows of deep pigeon-holes, of which the number was equal to that of the letters of the alphabet. These compartments were filled with boxes or movable registers (*casiers mobiles*), arranged in alphabetical order, each containing the individual bulletins, or certificates of conviction, pronounced in any part of France against all persons born in that district, (*arrondissement*.) As soon as a sentence is pronounced by any tribunal (even though it be military or naval) the clerk of the district in which the prisoner has been convicted is obliged, on pain of a fine, to immediately address, signed by the attorney for the government, the certificate of his sentence to the registry of the district of which he is a native. Each certificate is on a single sheet, of a prescribed form and size, to facilitate the handling, and on strong paper to prevent its destruction. I examined, with lively interest, a great number of these certificates, giving the criminal history, so far as it is found in the records of courts, of prisoners convicted from one to twenty times—often in a half dozen or dozen different places. They fully met the demand of the author of the Code Napoleon for a complete criminal biography of every

man who had suffered the arrests of justice. Now there is just such a registry in every arrondissement or jurisdiction of France. There is, therefore, no longer any uncertainty possible in regard to the antecedents of any person charged with crime. A telegram, addressed to the register of his place of birth, immediately brings the statement that there is no record in his case, or a recapitulation of all the convictions previously had against him, no matter where, no matter when.

But suppose the accused to be of foreign birth, or to be ignorant of his birth-place, or to conceal it. M. de Marsangy has not forgotten or failed to provide for such contingencies. For these three classes he has caused to be established in Paris a central dépôt of certificates of conviction in the department of the minister of justice.

There are thus two centers of investigation. When the conviction of a person, arraigned before any tribunal in France, is found neither in the registry of his birthplace nor in that of the ministry of justice, M. de Marsangy regards it as an almost certain proof that he has never before been, in that country at least, under the hand of justice.

I will not stay to point out the many and great advantages which must accrue to a country in which such a system has been established and is efficiently administered. Whoever wishes to see them set forth with equal force and eloquence is referred to a paper furnished by their author to the penitentiary congress of Cincinnati, and published in its volume of transactions.*

The system of criminal registers, by the very simplicity of the principles which form its basis, is easily applicable to all countries. The four following measures constitute all the conditions precedent which are necessary to the establishment and successful working of the system in any state: 1. That a register of births be kept in duplicate copies, and that, every year, one of these duplicates be deposited in the registry of the tribunal of the district. 2. That each clerk of the court of the district have a case made, containing a certain number of compartments for the reception of the boxes or movable registers, (*casiers mobiles*,) arranged in alphabetical order, which are to serve as depositories of the individual certificates under each letter. 3. That the certificate of every conviction, wherever had, be immediately addressed to the tribunal of the convict's native district. 4. That every magistrate, prosecuting an offender, be required to obtain from the clerk of the district of which he is a native, and to attach to the proceedings in the case, the certificate recapitulating all prior convictions against him which may have been collected and classified in his native district.

A careful study of the most effective means of identifying accused prisoners previously convicted, and of the criminal registers, among other agencies having this end in view, is worthy of the best minds in our country, and especially of those who are called to make or execute the laws.

§ 10. Reference was made in the last section to the scantiness and untrustworthiness of penitentiary statistics in this country relating to relapses and recommitments. But the remark might receive a broader application. Indeed, the whole science of statistics, and more particularly as it relates to crime and criminal administration, is too little appreciated, and therefore too much neglected in the United States. We have no general, and especially no uniform, system of penitentiary statistics for the whole country. But such a system is a great desider-

*A copy of said transactions can be had, without charge, by applying to Dr. Wines, secretary National Prison Association, No. 320 Broadway, New York.

atum; it is, indeed, almost essential to broad and solid progress in this department of social progress. The laws of social phenomena can be ascertained only through the accumulation of facts. Returns of such facts, carefully gathered from a wide field of observation, and skillfully digested and tabulated, are indispensable to enable us to judge of the effect of any law or system which may have been put in operation. What we want to know is the facts; but a knowledge of the facts relating to so complex a subject as that of crime and criminal administration implies a mass of figures, collected from all quarters, and arranged with reference to some well-defined end. The local and the special are to little purpose here. It is the general only that has value; that is to say, returns so numerous, so manifold, and drawn from so wide a field and amid such diversified circumstances as to give real significance to the results. It is such returns alone that will yield inferences of practical value. We want to get an average; but in order to this, we must have scope and variety enough, both in the range and character of the returns, to be enabled to eliminate from them whatever is local and accidental, and to retain only what is general and permanent. Only on this condition can our conclusion as to what constitutes the essence of the matter be sound and safe. Only on this condition shall we be able to feel that our inferences rest, not upon mere incidents of the phenomena, which may be partial, casual, and immaterial; but upon the phenomena themselves, apart from variations which are only temporary or adventitious.

We wish to know, for example, whether the stern severity of the old system of prison discipline, or the benign pressure of the new, is the more successful in diminishing crime. How are we to decide this question? Obviously, our decision will have little force, unless our facts shall have been collected from a wide territory, and under a great diversity of conditions; so that every phase of the phenomena shall have been included in our returns, and all that is special and exceptional shall have been corrected, and a result reached, not neutralized or vitiated by any circumstances which have not been noted and due allowance made for them in the analysis. But the materials for a generalization having the breadth and trustworthiness here supposed are criminal and penitentiary statistics. A reformatory prison in one place may signally succeed, and in another as signally fail; yet the success of the one and the failure of the other may have little value as an argument, since they may have been due to accidental causes—the competency or incompetency of the head, for example—and they will, therefore, afford no ground for any general conclusion. But if the experiment of the new and milder discipline has been tried in a score of different places, and under conditions widely variant, and yet has always succeeded in securing a larger proportion of reformations than the old and more rigid system, except in a very few cases where the failure can be clearly traced to adventitious causes, such an induction will afford a solid basis for our inferences, and we shall feel that we stand upon a rock in affirming the proposition that kindness is more efficacious than severity in reforming prisoners and leading them back to the paths of virtue.

In proportion, therefore, as our facts are gathered from narrow districts and confined to short periods of time, our generalizations will be unsafe as a basis of argument, for we can never be sure that the mere accidents of the experiment may not have determined the character of the result. A practice founded on conclusions arrived at in this way, though scientific in form, would be empirical in fact; dogmatism

would have been mistaken for induction. Nor can this false reasoning be corrected otherwise than by returns which, if not universal, are at least general; that is, broadly comprehensive both of space and time. As we know crime to be occasionally local and epidemic, so, under certain conditions, may reformatations be; for what else are those mighty revivals of religion which have marked the history of the church in all ages? Results may be secured in one place and by one agency, which we may in vain seek to parallel in another place and by a different agency. If we would know what a curative agency applied to criminals can accomplish on the whole, we must know what it is effecting in the manufacturing towns and the rural villages, what in the sea-ports and the mountains and valleys of the interior, and what in the coal beds and the gold mines. We must learn its results, not in selected spots and under particular circumstances, but over broad regions and amid conditions endlessly varied. The essential, inwrought power of a system of prison discipline then comes out and makes itself manifest, when it is seen in conflict with the special obstacles it has to encounter in the agricultural, commercial, manufacturing, and mining populations of a country. The result of its struggle with all opposing forces is the result which alone is of any worth to us. And this can be known only as the facts are gathered from all these fields, and are collated, digested, and reduced to tabulated forms upon some uniform system, or at least in a way that will admit of practical comparison.

We want such statistics, uniform, full, and collected with regularity, year by year, from all the prisons and reformatories of the country. What do the American people know about American prisons? Something they know of the prisons of Charlestown, Sing Sing, and Philadelphia; but what information have they of the condition and progress of prison discipline in Oregon, Texas, and Arkansas? How many know the principle on which labor is organized, and the manner in which it is conducted in the penitentiaries of Nevada, Kansas, Alabama, and Georgia? Yet prison discipline is a mighty interest, touching profoundly the nation's well-being, and, as it succeeds or fails, involving its material interests to the extent of millions, aye, scores of millions every year. Is not prison discipline, then, a subject in which the people everywhere ought to be interested, and on which they need information, full, systematic, and regular? It is not in reference to a prison here, a reformatory there, and a truant home somewhere else, that they require to be informed; but they should have such information touching all the penal, reformatory, and preventive institutions of all the States; and then they would be able to judge whether the work of reforming criminals is really accomplished among us, or whether our penitentiary system is, so far forth, a mistake and a delusion. In the former case all we would need to do would be to "go on unto perfection;" in the latter it would be necessary to retrace our steps and take a "new departure."

It is not, however, simply in a national view that penitentiary statistics are valuable; they have an international importance as well. The Congress of London expressed very clearly its sense of this importance by the appointment of a permanent international commission, charged, among other functions, with the duty of devising, and, if possible, carrying into effect a scheme for a comprehensive system of international criminal and penitentiary statistics, based on common principles, employing common formulas, and arranged in such manner as to be a true measure and index of the crime, the penal administration, and the prison discipline of all civilized countries. The National Prison Association is the only organization in this country having a field of operations broad

enough, and at the same time the requisite machinery, to co-operate in so vast a work. The association is disposed to give special attention to an enterprise recommended by so respectable a body, and promising results of such signal utility, not to our own country alone, but to the whole human race. It is obvious, however, that the prosecution of such a work, where the very agencies through which it is to be effected will have to be created, will involve no inconsiderable expenditure of money, as well as an immense amount of labor. The labor it is willing to assume; the money must be supplied from without. Impressed with the importance, in a national point of view, of the end proposed, the association sought from Congress, at its last session, a grant of \$10,000 to enable it to pursue that end with the vigor requisite to its accomplishment. The Senate inserted in the annual deficiency bill the appropriation asked, but it was thrown out in the conference committee, and so failed. The application will be renewed at the next session, when better success may be anticipated. It was well understood by the London Congress, and the opinion freely expressed, that so great a design could be accomplished only through the generous co-operation of the governments of the whole civilized world, which, it was believed, would be readily accorded, in view of the beneficence as well as the vastness of the results to be expected. Mr. Beltrani-Scalia, of Italy, secretary of the commission, has prepared a complete series of formulas for recording the statistics sought; and the governments of various European countries have already given their adhesion to the plan, and promised co-operation. It is not to be supposed that the government of the United States will decline co-operation when it learns that other governments are lending their aid, and especially when it comes to understand the real nature and importance of the work, and an organization competent to its performance stands ready and is even anxious to undertake it.

§ 11. A system of prison discipline, to be really reformatory, must work *with* nature rather than *against* it. If we would improve men, whether *in* prison or *out* of it, we must not ignore, much less crush, those great principles which the Creator has, for wise purposes, impressed upon the human constitution. The principle of sociability, for instance, is one of the strongest instincts of the soul; one of the mightiest forces of human progress. Can we safely thrust it aside in our effort to reclaim and reform fallen men? Captain Maconochie's great experiment in prison discipline on Norfolk Island, with its great harvest of reformations of even the most hardened criminals, is well known. But he himself declares that his task was not really so difficult as it was thought, nor its results so wonderful as they appeared, for the reason that he was working with nature, not against her, as most other prison systems did. He sought to cherish, and at the same time to direct and regulate, those cravings for improved position which all men possess in some degree, and which are often strongest in those otherwise most debased. Under the guidance of right principle, he found that his men, most of whom were steeped in crime, rose easily to order and exertion. But this result was not accomplished by a system of pampering and weak indulgence. On the contrary, he held a steady hand, and his discipline was firm and energetic, though always just. He did not fail to inflict punishment when deserved; but he applied it within the limits assigned both by the letter and the spirit of the law, not by excesses of authority beyond it. The law imposed imprisonment and hard labor, and these he caused his men, in the fullest sense, to endure. Every one was required to perform, to the last stroke, his allotted task; but he was saved all needless humiliation, and was encouraged to look to his own steady

efforts for the amelioration of his lot and for ultimate liberation. And this, he modestly declares—not the efforts of an individual, however zealous—was the real secret of his success.

This principle of working *with* rather than *against* nature, in prison management, is in direct contradiction to existing systems of penitentiary discipline, and to the practice of most, happily not all, individual prisons. Coercion is, in most systems and prisons, the supreme force. The separate system is the most perfect form of coercion ever devised; men are utterly helpless in its grasp. But the silent system does not much differ from this. The silent, like the separate, system rests, in its last analysis, on the principle of isolation. The only difference is, that in the one case the isolation is accomplished by an absolute bodily separation; in the other, it is of a moral kind, being effected by the enforcement of an absolute and eternal silence. The principle of sociability has no more play under the one system than under the other. At least so far as theory goes it has not; for if the theoretical silent system were or could be practically enforced, which is impossible, men would work side by side for years, yes, for a life-time, without exchanging a thought by word, look, gesture, or any token whatever. Now all this constitutes a species of domestic slavery; and it sets such systems aside as ordinary agents of general reform. I do not deny that individual reformatations take place under them; but this is not so much through the system as in spite of it. Coercion is not a soil in which the tender plant of moral reform ever grew; or, at least, in which it can be ordinarily expected to grow. Such rough-riding over human nature is irreconcilable with every principle legitimately founded on its study.

Prisons should be made great workshops, or industrial establishments, where the inmates are systematically trained to be skillful, steady, sober, and *voluntarily* industrious; and where all the arrangements for labor are, at the same time, so like real life, as to be a natural preparation for it. The voluntary character of the labor cannot be too strongly insisted on. Compulsory labor—labor into which the will of the workman does not enter cordially—is, as a rule, rude, heedless, unskillful, and therefore unprofitable. It is free, and, still more, emulative or competitive labor that is earnest, ingenious, skillful, and productive. The economical improvement under such a system would be felt almost as soon as the moral; nor, indeed, can these ever be disjoined. No doubt it would require care and discretion, in the first instance, to organize such establishments. But the skill employed in their organization must be like that highest art which conceals art; and it must, above all, be content to sow good seed, and then wait, without forcing, the expected return. It would be easy to produce immediate results; but these would be ephemeral. Possibly the wisdom which is willing to wait can be gained only in the school of experience; but the test of renewed convictions after discharge would at length teach it effectually. When the lesson not to go too fast, to give a large scope to free agency, to let temptation assume all its customary forms, to regulate little but encourage much, is sufficiently learned, complete success may be hoped for in what should ever be the great aim of public punishment, the reformation of the fallen.

Much has been said of the demoralization and corruption resulting from the association of prisoners, especially with liberty of intercommunication. No doubt if, as on the usual principle of prison management, only their worst feelings are called out, and their intercourse is without guidance or control, the association of prisoners will be corrupting. But if their better impulses are brought into play—and Maconochie, Montesinos, Obermaier, Crofton, Sollohub, and Guillaume have shown that,

by proper combinations, this may be done without sacrificing any measure of just and reasonable punishment—prisoners will be found very much like other men.

It is argued that, however the association of prisoners with free persons might be advantageous to the former, that of prisoners with prisoners cannot but prove hurtful to them. But this is a gratuitous, and, in my opinion, wholly erroneous assumption. Every one knows that it is easier to influence men in a body than individually, and that, when once in motion, they will go further, since they mutually help one another by the common enthusiasm created by the union. Moreover, strange as the proposition sounds, there is a natural tendency in numbers toward right feeling. Witness the clap-traps of a theater, which are generally high moral sentiments. Witness the further fact, that the better feelings of a mob are rarely appealed to in vain. On the field of battle, the most heroic devotion, even to the sacrifice of life, is often called out at a word. In none of these instances, probably, could the same generous response be obtained from a single individual, which he renders, not only spontaneously, but enthusiastically, as one of a body. Captain Maconochie says that, on Norfolk Island, he could have done nothing with the prisoners separately; that the best of them would have remained only dogged under his exhortations; and that, in Birmingham, he would neither have gained the boys as he did, nor would they have been able to influence each other outside as they did, if they had been shut up in separate cells. The experience of Montesinos at Valencia, of Obermaier at Munich, of Crofton at Lusk, of Sollohub at Moscow, and of Guillaume at Neufchâtel, was, as we have seen, all of the same nature.

There is a reason of much cogency why greater prominence should be given to the social principle in our systems of prison discipline. Crime is essentially and intensely self-regarding, self-seeking, anti-social. Hence it is fostered by the selfish, and checked by the social, element of our nature. This fact is noted by Herbert Spencer in his Essay on Prison Ethics. He remarks: "The natural prompter of right conduct to others, and the natural opponent of misconduct to others, is sympathy; for out of sympathy grow both the kindly emotions, and that sentiment of justice which restrains us from aggression. Well, this sympathy, which makes society possible, is cultivated by social intercourse. By habitual participation in the pleasures of others, the faculty is strengthened; and whatever prevents this participation weakens it—an effect commonly illustrated in the selfishness of old bachelors. Hence we contend that shutting up prisoners within themselves, or forbidding all interchange of feeling, inevitably deadens such sympathies as they have, and so tends rather to diminish than to increase the moral check to transgression. Thus there is good reason to think that while silence and solitude may cow the spirit or undermine the energies, they cannot produce true reformation."

The principle is, that life within prison must be made as close a copy of life outside as may be, without sacrificing any of the just ends of public punishment. One of the most important parts of the machinery by which Captain Maconochie proposed to attain this object, was his mark system, which has been already partially explained. It will be recollected that his plan was to have labor sentences instead of time sentences—specific tasks to be measured by marks, and to be worked out by the prisoners. No supplies of any kind, whether of food, bedding, clothing—not even education—were to be given *gratuitously*; all were to be made exchangeable, at fixed rates, as the prisoner needed and was

willing to buy them, for marks previously earned ; with the distinct understanding, however, that only those which remained over and above all so exchanged, should count toward liberation. The prisoners, like free citizens, were thus made to depend, for every necessary and comfort, on their own industry and personal deserts ; while their prison offenses were restrained by fines to be paid in marks, just as those of persons outside are by fines in money or privation of liberty. Describing the practical working of his method, Captain Maconochie says :

“First, it gave me wages, and then fines. One gave me willing and progressively skilled laborers ; the other saved me from the necessity of imposing brutal and demoralizing punishments. My form of money next gave me school fees. I was most anxious to encourage education among my men, but, as I had refused them rations gratuitously, so I would not give them schooling either, but compelled them to yield marks to acquire it. I never saw any other adult schools make such rapid progress. My form of money next gave me bail bonds in cases of minor or even of great offenses ; a period of close imprisonment being often wholly or in part remitted in consideration of a sufficient number of other prisoners of good conduct becoming bound, under penalty of the forfeiture of a certain number of good marks, for the improved conduct of the culprit.”

Even in the establishment of a sick-club and a burial-club, Captain Maconochie applied the inflexible principle of “nothing for nothing”—that is to say, here, as throughout, he made the discipline of the prison as much like the discipline of Providence in free life as possible. He sought to make all his arrangements such that the prisoners would experience, through them, just such and so much of good or evil as naturally flowed from their conduct—a principle which he rightly declares to be the only true one. Now, what were the effects of a system made to conform, in so remarkable a degree, to the providential arrangements found in ordinary society ? The extreme debasement of the Norfolk Island convicts was notorious. They were the scum of all the penal colonies, sent to Norfolk because of their exceptional depravity. Yet reformations of these men were effected to an extent and of a character unknown, either before or since, in any of the penal colonies of the British Empire. This we must believe, unless all human testimony is to be discredited. How strong the attestation thus lent to the truth and force of the principle under consideration.

§ 12. In order to the best effect of a reformatory prison discipline, it should be divided into two distinct stages—the stage of punishment and the stage of reformation and training ; the former having in view the prisoner’s past, the latter his future. Both these processes, when the object is reform, are equally benevolent, because both are equally essential to the end in view. There can as little be true reform without true penitence, as there can be the growth of the man without the birth of the child. But the necessity for each is not, of itself, equally clear to criminals. Many who would, if possible, escape from restrictions as mere punishment, would willingly submit to them when understood to be a necessary antecedent of reform, and especially of release as conditioned upon reform ; for nothing is counted a hardship which tends to that issue. As a fever must be reduced before its ravages can be repaired, and as a wound must be probed and cleansed before it can be properly healed, so, in the moral cure of a criminal, a punishing stage must precede the reformatory stage. To do one thing at a time, and each well, is the rule in all nice operations ; and, surely, the recovery of a fellow-being from habits of crime to virtue, is worthy of an

equally methodical and careful procedure, and is not likely to be accomplished by one less scientific and delicate.

The necessity for separating these two processes may be placed in another light, and shown by a different argument. Subjection to punishment is an unnatural state, and interferes, necessarily, with that free agency, a sense of which is instinctive in man; whereas, on the contrary, a state of trial, of difficulty, of hardship even, supported by hope, and with its objects to be attained by voluntary exertion and self-denial, is a highly natural and improving state; it is the very state in which we are all sent into the world, and to which, accordingly, our faculties are especially accommodated. The two processes, therefore, cannot be combined, for either the restrictions involved in direct punishment destroy the free agency which is the essence of trial, or the concessions made to free agency weaken, if they do not destroy, the restrictions essential to punishment.

A testing stage should follow these two; but of that enough has been said in a former section.

§ 13. It belongs to the essence of a reformatory prison discipline to impart to the prisoner, during his detention, the power as well as the will to earn an honest living after his release. This can be done only by giving him, while he remains in prison, both the love and the habit of industry. Labor is at once a means of support and an auxiliary to virtue. It was a favorite maxim with Howard, "Make men diligent, and they will be honest." Work is the only sure basis of a reformatory discipline. "Unless prisoners acquire habits of industry and a liking for some kind of labor," says Mr. Frederic Hill in his admirable Treatise on Crime, "little hope can be entertained of their conduct after liberation." Good resolutions are well as far as they go; but, as a dependence for the future, unsupported by the habit of honest, useful toil, they will prove wholly fallacious. It will turn out with them as with sick-bed resolves, which usually vanish with returning health. Therefore, it is a matter of prime importance to impart to prisoners the knowledge of some regular business. The ranks of criminals are chiefly recruited from persons without fixed occupation, and especially from those who have never learned a trade. At least eighty per cent. of our imprisoned criminals belong to this class, which shows to what an extent the want of a trade becomes an occasion of crime. To teach a convict a trade is to place him above want, and that is more than half-way toward making him an honest man. A convict learning a trade is mastering the art of self-help. He feels that he is doing something for himself. As a consequence he is filled with hope; he is in better temper; his spirits are cheerful and buoyant. This feeling is itself a reformatory agency, and the man in whom it is found is much more likely to be morally improved by his incarceration than another in whom hope, alacrity, and cheerfulness have been extinguished. In one of his reports Mr. Rice states that of two hundred convicts discharged from the state prison of Maine, only seven had been reconvicted, and but two of these had learned a trade. Would it not be well, would it not be economical, to make less use of machinery in our prisons, and more use of the hands found there?

§ 14. Both religion and education are forces of vast potency within as well as without prison-walls. But their power and value are so well known, and have been so often and forcibly exhibited, that a mere reference is all that seems necessary in this report. Religion is the only power that is able to resist the irritation that saps the moral forces of these men of powerful impulses, whose neglect of its teachings has been the occasion of their being immured within prison-walls; while the

effect of education is to quicken intellect, give new ideas, supply food for thought, inspire self-respect, excite an honorable ambition, open new fields of exertion, and afford a healthful substitute for low and vicious amusements. What more need be said to show the value of these agencies in reforming criminals?

§ 15. All who would engage, with any hope of success, in the work of regenerating vicious and criminal humanity, must be animated by a hearty desire and intention to accomplish that result. Such a feeling and purpose, really entertained by all prison officials, would revolutionize prison management. It would change the whole spirit and tone of administration; and when that is done, the fit processes of a reformatory discipline will follow as a matter of course. It is not so much any specific apparatus that is needed, as it is the introduction of a really benevolent spirit into our prison work. It is the exercise of the Christian virtues as related to man that is wanted; and this, when exhibited under the control of principle and conscience, not of mere sentiment and impulse, is also the best manifestation of those virtues in their relation to God. Once let prison officers understand that their business is to *reform*—not merely to *punish*—their fellow-men, and let their desire and intention be conformed to that understanding, and they will speedily become inventive of the methods conducive to that end. Let the *principle* be established in theory and rooted in the heart of those who are to apply it, and suitable *processes* will follow, as naturally as the harvest follows the sowing.

§ 16. Equally essential is a serious conviction on the part of prison officers that prisoners are capable of being reformed. This belief is indispensable to success, for no man can heartily maintain a discipline at war with his inward beliefs. No man can earnestly strive to accomplish what in his heart he despairs of accomplishing. Doubt is an element of failure; confidence a guarantee of success. Nothing so weakens moral forces as unbelief; nothing so strengthens them as faith. "Be it unto thee according to thy faith," is not a mere theological dictum; it is equally the statement of a fundamental principle of success in all human undertakings, especially when our work lies within the realm of mind and morals.

§ 17. Greater prominence than heretofore should be given to moral forces, and less to mere physical power. A broad distinction must be made between physical apparatus and moral appliances in prison treatment. By physical apparatus is to be understood whatever is intended merely to coerce; by moral appliances, whatever offers a choice, and thus strengthens while it guides. The essential distinction is that between force and persuasion, between fettering the body and gaining the soul. The chief reliance, both for preventing crime and weaning from it, has been, and is, fear. Fear is no doubt among the most active passions and impulses of the soul. We all feel it, more or less, daily; and it ought, undoubtedly, to have a place in every system of crime-repression. Nevertheless, there is not an impulse of any kind—love, hatred, desire, hope, avarice—that does not continually overcome it, even in the most timid. Is it rational, then, in the effort to repress crime, to rest our chief confidence on the weaker rather than the stronger agencies, especially when it is considered that the promptings to crime usually proceed from the most powerful impulses of the human breast? There needs to be introduced into prison discipline a higher aim, a treatment of prisoners that seeks to gain the will, and not merely to coerce the body. What is wanted is, that they be trained to become virtuous freemen, and not merely that they be reduced, for a time, to the posi-

tion of well-ordered bondmen, taught the virtues of a state of slavery—obedience, submission, punctuality, order, and the like—but, of necessity, accompanied by a large admixture also of the vices of slavery—deceit, duplicity, evasion, latent but cherished resentment, and a thicker cloak of hypocrisy, which, however, only conceals, with more or less art, the continued rottenness within.

Criminals are too commonly considered the representatives of crime; and harshness toward them is thought to be a legitimate manifestation of our detestation of it. Should they not rather be looked upon as its first and saddest victims, to be pitied as well as blamed; to be pitied all the more for being bankrupt in virtue and character as well as in means? If we would earnestly seek to raise them from this state, not by weak and unwise indulgence, but by a judicious course of firm and even severe training, which would develop their manly and stimulate their moral nature, we should show a better understanding of the subject and of our duty in relation to it, and be much more successful in the great end of repressing crime. Only let us try; try in good faith and with good will; not halting between two opinions, but steadily and energetically acting upon one. The result would not long remain doubtful; and the greatest and gravest moral problem of our day would be at length satisfactorily solved.

All past systems of prison discipline have been, in the main, but modifications of *force*. Authority has been their chief, too often their exclusive, reliance. The result, so far as reforming criminals is concerned, has been failure. Let *organized persuasion* now have a trial; not coaxing, not pampering, not indulgence—a system as pernicious as it is false and feeble—but persuasion, with such forces behind it, resulting from a judicious application of motives, as, while leaving the will free, will yet, by a sort of moral necessity, determine it to a right choice.

The coercive system would seem to be an inherently and essentially vicious one, insomuch that precisely where it is most perfect, it will be found ultimately least successful. Mind can be gained only by appealing to mind. Fettering the body is even directly opposed to this. It has its immediate and apparent advantages; but they are too dearly purchased. If we will actively employ our prisoners, and by suitable means cultivate in them the daily practice of the manly and social virtues, they will protect themselves from degrading vices much better than we can protect them by walls and bolts; and the moral triumph thus achieved will be as improving and strengthening to them as the triumph won by physical force is humiliating and enfeebling.

Let me briefly indicate two or three of those moral forces whose use would be likely to be attended with the best results.

The ability of the prisoner to better his condition while in prison through his own exertions—in other words, a regulated self-interest—is one of the mightiest as well as the healthiest of these forces. Montesinos found this so in his prison at Valencia. He convinced himself that men in prison, as well as men outside, need the *stimulus* of some personal advantage to be derived from their exertions. He says that what no severity of punishment or constancy in applying it could force out of his men, a very moderate personal interest readily obtained. In different ways, therefore, he constantly applied this powerful stimulant, and the excellent results it yielded and the fruitful germs of reform developed by it convinced him at length that the most inefficacious of all methods in a prison and the most fatal to every chance of reform are punishments carried to the length of harshness. It was not, he

says, till after many trials of severity that he ultimately made the principle of encouragement and persuasion the basis of all his operations on the minds of the prisoners. He caused forty-three distinct trades to be taught in as many different workshops, and stimulated industry and skill by allowing the prisoners a large share in the product of their toil. The administration of Colonel Montesinos lasted fifteen years, and the results were: 1, ready submission, few punishments, and a high state of discipline; 2, the ability to dispense almost entirely with a paid staff by the substitution of the most intelligent of the reformed criminals as under-officers; 3, the complete self-support of the establishment, so that never a dollar was called for from the state; 4, the reduction of relapses from 40 per cent.—the average prior to his incumbency—to zero, not a single recommittal having taken place during the last three years of his administration, and an average of only one per cent. during the ten years preceding.

The cultivation of a feeling of self-respect in prisoners develops a moral force, of great potency in prison administration. Self-respect is one of the most powerful sentiments of the human mind, for the reason that it is the most intensely personal. Hence the maxim, "Do not further degrade in prison the man who has come to it already degraded by his crimes," should be constantly and carefully applied in prison treatment. No one will ever beneficially influence prisoners who does not seek to strengthen in their breasts the sentiment of manhood and personal dignity.

Moral power over prisoners may be attained through frequent, frank, kindly conversations with them—not too familiar, but judicious and self-respecting. This was an agency constantly employed by Maconochie, and he ascribes to it much of the influence that he gained over his men. He encouraged all to address him with freedom, and he would not even listen to a man unless he stood erect, looked him in the face, and spoke to him like a man. He used to say to them that he would rather have a man insolent than cringing. He encouraged all to speak freely to him, and to express, without reserve, their views and sentiments on whatever was the subject of conversation. By this means he was enabled to sound their impressions and the sources of them much more deeply than would otherwise have been possible. He made it a special object when thus conversing with a prisoner to interrogate him about his early youth and training, his parents, the lessons they had taught him, the example they had set him, &c. His design in this was to call up the associations of earlier days, and thus endeavor to revive in him the good impulses and principles which had guided his conduct before he became corrupted and seared by the scenes through which he had subsequently passed. In this way he obtained an immense power over his prisoners, which he skillfully and effectively applied as an agent in their reformation.

"The law of love and love in law"—in other words, kindness duly regulated—is a moral force of almost illimitable power. The kindness proposed is not, however, that which seeks merely to alleviate the immediate suffering of prisoners, which they have deserved and ought to undergo. It is rather a rational, prudent, forecasting kindness, which seeks to lift them up, to strengthen them, and to prepare them for the battle of life. Such a spirit universally introduced into our prisons would work wonders, both on the character of the prisoners and the movement of crime. This spirit once there, this aspiration after the moral improvement of their charge felt by the officers and recognized by them as a duty, would prove both inventive and creative in their hands. It would *find* or *make*

means to accomplish the reform of their prisoners, and when one agency proved abortive it would have recourse to others; *it would not be wholly balked*. Further, as we see in the case of M. Demetz and Mettray, such a spirit having once found a lodgment in the breast of prison officers, and constantly working itself out into action, would not long be confined within the prison walls, but would follow into society, after their discharge, those who had felt its beneficent power during their captivity, and would thus tend prodigiously to prevent relapses and, as a consequence, to diminish the volume of crime. What a change would the general possession and manifestation of this spirit produce in the tone and temper with which prisoners are treated! This is now too often supercilious, if not even contemptuous, whereas it should be rather that in which patients are received and treated in a hospital. Certainly the hatefulness of the crime committed should be freely expressed. On this head there should be no compromise. But apart from this, the criminal should be sincerely regarded and studiously treated as an object of compassion, fallen but recoverable, and sent to prison expressly to that end. A tone of hopefulness for his case should thus be maintained, and confidence felt and shown that, when put in the right way, he will be manly enough to abide in it. This idea of manliness and courage as belonging to virtue, and of abjectness and cowardice as inhering in vice, should be especially insisted on. The greatest benefit has resulted from it in dealing with rough and fallen natures. It is an idea that comes home to many men otherwise hard to be impressed, and to whom, on the other hand, any approach to whining or cant is distasteful, and becomes an object of scorn and scoffing.

It is important to note, in passing, that a liberal application of the law of kindness to prisoners is not incompatible with a calm, steady, resolute discipline. Tenderness may be fitly and successfully blended with justice in dealing with them. It is not a just rigor against which the prisoner rebels, for that may be as kind as it is wise; it is rather against capricious harshness, which is cruel and irritating for the very reason that it lacks the element of justice. Criminals are not much accustomed to kind treatment, and therefore they are the more touched by it. Convince them that you have a genuine sympathy, show them a kindness which evidently has its seat in the heart, and their sensibility is instantly awakened. This principle keeps a lingering hold upon our nature even in the last and lowest degree of human wickedness. When all other generous sensibilities are gone, this survives and shows itself even in the most hardened criminals. There is, somehow and somewhere, a soft part about them, which will give way before the demonstrations of a genuine tenderness and love. This one germ of a dormant virtue, this solitary element of an improved character, is found to outlive the destruction of all others; insomuch that, fallen as a brother may be from the moralities which once adorned him, the manifested good-will of his fellow-man still carries a charm and an influence along with it. There lies a regenerative and redemptive power just here, which no degradation can crush, no depravity extinguish.

§ 18. Individualization is an essential principle of a reformatory prison discipline. There was a general agreement in the congress on this point. It was held unanimously that, to insure the highest improvement of prisoners, prisoners must, to a certain extent, like the different members of a household, be treated individually. While all alike are placed under a general law, the conduct of each, as directed by it, should be specially and minutely noted. The improving effect of this would be found very great. It would be a first step toward restoring to

each that feeling of self-respect without which no recovery will ever be found permanent. Each should be enabled to know, if possible, from day to day, and certainly from week to week, the light in which his conduct is viewed, in all important particulars, by those placed over him; for thus alone, as his good purpose strengthens, will he be enabled to correct that wherein he may be found deficient. To this end a card might be hung in his cell, with four rows of figures constantly kept upon it. The first should indicate the prisoner's general conduct; the second his degree of industry and exertion; the third his attention and improvement, as noted by the chaplain; and the fourth the same, as shown by the schoolmaster's record. By this means, whenever the warden or chaplain, or any person entitled to make such perquisition, goes round, the whole conduct—and thence the character—of the individual would be instantly patent, and commendation, censure, caution, advice, or exhortation could be addressed to him as each might be needed. These marks would also form the basis of those estimations of character according to which prisoners would be passed through the different stages of treatment, rising successively from grade to grade, until, beginning at the lowest, they should have at length reached the highest.

It will be found important that rewards for exertion and improvement, other than physical comforts, be progressively added; or even that they should, at the discretion of the authorities, be substituted for such comforts. It is right and fair, and even improving, that consideration for the last should be used as a *stimulus* in the lower stages of reformatory treatment. Such, indeed, is the arrangement of Providence in human society, and we cannot copy a better type. But in proportion as the higher nature of the prisoner is developed and cultivated, higher objects of desire should be suggested and made similarly attainable, in order at once to keep the upward tendency active, and to raise the character of its aspirations. For this purpose a longer allowance of gas-light, a wider scope of books and instruction, and increased facilities of communication with families and respectable friends outside, and other like indulgences will be found powerful and most improving encouragements. At no stage, however, should any remission be made of the call for continued active exertion. To reward a prisoner, in any part of his course, by permitted idleness, is to undo the improvement that may have been already effected in him by dissociating the ideas of sustained effort and success, which should, as much as possible, be kept inseparably together in his mind. Even when partially sick, employment of some kind should, wherever practicable, be thus given him. The surgeon should be constantly invited to suggest such. Not infrequently this will even promote recovery—if not otherwise, yet by making a state of sickness not entirely a state of exemption.

§ 19. It is almost superfluous to remark that such a prison system and prison administration as that sketched, all too imperfectly and feebly, in the preceding sections of this concluding chapter, cannot be carried out in its true spirit, nor with the necessary intelligence and vigor, by the agents at present engaged in the work. We have, happily, even now, many heads of prisons, holding sound views, imbued with the right spirit, thoroughly competent to the duties of their position, and working with zeal and intelligence in fulfilment of their high mission. These have a few able and well-qualified assistants, who are animated by the same sentiments as themselves, and are lending to their aims and efforts a noble and efficient co-operation. But the mass of prison officials, throughout the country, are sadly deficient in the broad intelligence, good feeling, self-control, sound common sense, high moral principle,

strong religious feeling, and other essential qualifications requisite to their calling. It is idle to suppose that an equitable and humane—above all, a reformatory—prison code can be carried out successfully, where a fit administration cannot be had. To deal with delinquents, not by short and sharp methods, but through such pains-taking, cautious, and tardy processes as abstract justice indicates, and the attainment of genuine and permanent reformatory results imperatively demands, would require a class of agents which is yet, as a body, to be created. Nor, in my humble judgment, can such a creation ever be effected, except by special effort, special education, special training to that end. The reformation of fallen humanity is a work as complex, as delicate, as difficult, and demanding qualities and qualifications of intellect, judgment, and heart as high and as broad as any ever committed to the hand of man, and as worthy of being raised to the dignity of a regular calling or profession as any other within the wide range of human employment. If law, medicine, and divinity; if engineering, military command, and school-keeping; if sculpture, painting, and music; if even every handicraft requiring mere manual dexterity demand a special technical education and training in those who devote themselves to these callings, why not equally the work and calling of a prison keeper, whose proper business—the regeneration and redemption of fallen immortals, the cure of souls all sick and leprous with sin—is the peer of any of them in the dignity, grandeur, and beneficence of its aims. Mettray, with its glorious chief, who had the wisdom to establish his training-school even before he established his prison—Mettray, with its magnificent reformatory results, as the fruit and demonstration of that wisdom—is a living, visible, irrefragable argument in support of the value, the importance, the absolute necessity of a special preparation on the part of prison officers for their work. Let that argument, for present purposes, stand in the place of all others.

§ 20. The necessary complement of every prison system, which really aims to reform its subjects, is a comprehensive and efficient agency for the care of discharged prisoners. The moment of their liberation is, for them and for society, so far as they are concerned, a crisis whose gravity cannot easily be exaggerated. Their good intentions and their actual improvement in prison are then severely tested. The question is to be determined whether they will pursue the path of virtue, or return to crime. A few weeks, at most a few months, will, in all likelihood, decide the point. The trial is often one of terrible severity to the discharged convict. The temptations which surround him are strong and pressing. There is a fearful conflict in his soul. He wishes to do right, but is sorely urged to do wrong. He desires to stand, but trembles lest he should fall. He would do good, but evil is present with him. He starts at his own shadow. He feels that, like Cain, he is “a fugitive and a vagabond on the earth.” Terrible, indeed, are his struggles, for he has foes within as well as without to combat. His soul is driven to and fro between the frowns of the world and the upbraidings of conscience. These awaken remorse; those, despair. What does the released prisoner need in this, with him, supreme hour? First of all, sympathy, which will act like a cordial upon his bruised and fainting heart. Then he needs words of encouragement and hope, of wise and affectionate counsel, which will still further refresh and strengthen his spirits. He needs, moreover, pecuniary help. Some money or its equivalent he must have, or crime becomes a necessity. The best provision of this kind would be to allow him some share in his earnings as a prisoner, to be retained for him to the day of his liberation; but until such al-

lowance is accorded, which is equally the dictate of justice and policy, private benevolence, or, better still, the state, should extend some assistance of this sort, enough at least to enable him to "make a start in the world." But most of all, the discharged prisoner needs employment. At the earliest possible moment, therefore, he should be put in a position to help himself. Self-help is the best help he can have, for it gives independence, self-respect, and inward force. Sympathy, kind words, good advice, are all excellent in their place; but they are useless—worse than that, they are mockery—while you leave the man hungry and shivering, with nothing to do. But back your words with acts; give work as well as counsel; and then the words and the counsel have a mighty power; they become living forces.

Messrs. Haines and Howell, commissioners from the State of New Jersey to the Congress of London, in the report submitted by them to the governor of the State, have offered some excellent suggestions on this point. After citing the declaration of the congress that "the prisoner, on his discharge, should be systematically aided to obtain employment," the commissioners add:

"The truth of this sentiment has been frequently and painfully proved. Prisoners who, when discharged, gave evidence of thorough reformation, and who sincerely believed that they could keep their solemn resolution to live honestly, for want of employment and consequent poverty, and taunted, and sometimes threatened by those who knew of their conviction, have been driven to the haunts of vice and plunged again into crime. With the aid of some friendly hand to afford them suitable employment and means of self-support, many such might have become good citizens and contributors to the material wealth of the community.

"An agency for providing discharged prisoners with employment is a present and pressing necessity—one that is deeply and painfully felt. In some States this has been committed to individual effort and benevolent associations; but it is obviously the duty of the State, and properly devolving upon it. If the protection of society is to be secured by the imprisonment and reformation of the convict, surely that protection should be continued by such measures as will provide against a relapse into crime and a repetition of the former process of punishment.

"An officer of the prison, or what would be more effectual, an agent appointed for the purpose, charged with the duty of ascertaining the capacity of the prisoner, and securing for him suitable employment, would do much to promote the peace and safety of society, and secure many unhappy persons from temptation and repetition of crime, and aid in restoring them to the condition of useful citizens.

"If it be objected that the appointment of such an agent would increase the offices of the prison and the expenses of the State, it may be answered that such increased expense will prove to be the truest economy. The investment of the small sum for the salary and expenses of the agent would insure large profits to the State by saving the charges of reconviction and support of the prisoner, and by rendering him, who had been a burden, a contributor to the material property of the State.

"This is the financial and lowest point of consideration of the subject. If we regard the moral and social effects of such a measure, and compare the condition of one reconvicted, and his influence upon his family and the community, with that of one reformed and returned to the ranks of honest and productive industry, we can have no doubt of the propriety, the necessity, and the economy of such an office."

§ 21. So far, the "suggestions and recommendations" submitted by the undersigned have been of a general character. He ventures to add a par-

agraph more specific in its aim. The National Government has no prisons of its own. It has a criminal code and criminal courts. Men charged with criminal offenses are arraigned, tried, and convicted under its authority; but, when so convicted, it has no prisons to which it can send them for treatment. It is compelled to sentence them for punishment to the prisons of the States in which they happen to have had their trial; at least, such is the general practice. It has no control, no influence, over the discipline of the prisons to which they are committed. That discipline may be cruelly severe or unwisely lenient; it may make its subjects worse instead of better; it may send them out more depraved and hardened than when they entered, and more certain to continue their evil courses; but the government has not a word to say; it cannot lift a finger; it cannot exert a single counteracting force; it can only sit silent and let the work of corruption go on. Is this wise? Is it right? Is it statesmanship? Has the government no responsibility in regard to these men whom it has convicted of crime? Is their salvation a matter in which it has no concern, no interest, no duty? Is it not bound, in honor and conscience, to try to reform them and send them back to society regenerated in purpose and in life, with the will and the power to eat bread earned by honest toil? If it has any such duty in regard to these men, can the obligation be discharged by sending them it knows not whither; by committing them to it knows not whom; by subjecting them to a treatment which it has no power to control, and to influences in regard to which it does not even know whether they are good or bad, salutary or pernicious? General Coburn, chairman of the Military Committee of the House of Representatives, and General Logan, chairman of the Military Committee of the Senate, succeeded in getting an act passed by the last Congress providing for the establishment of a United States prison, in which prisoners tried and sentenced by military courts may receive the benefits of a humane and reformatory discipline; for so the act declares in express terms. Whatever reasons there may be for such a prison and the application of such a discipline in the case of military prisoners, there are many-fold more and more cogent reasons for such appliances in the case of persons convicted of crime in the civil courts of the United States, both because these latter are much more numerous and because they stand in much greater need of a reformatory treatment, their offenses being, for the most part, less against technical rules and more against law and morality, and springing, therefore, from a deeper moral taint. For these reasons, and others that might be adduced, the undersigned does not hesitate to "suggest and recommend" the immediate establishment of one prison, at least, for the treatment of persons convicted by the civil courts of the United States, and the addition of others as they may be found necessary or convenient, in which a discipline, based upon the principles set forth in this closing chapter of his report, may be honestly, intelligently, and faithfully applied.

All of which is respectfully submitted to the President:

E. C. WINES,

Commissioner, &c., &c.

TRANSACTIONS
OF THE
NATIONAL PRISON REFORM CONGRESS,

HELD AT
BALTIMORE, MARYLAND, JANUARY 21-24, 1873;

BEING THE
SECOND ANNUAL MEETING OF THE NATIONAL PRISON ASSOCIATION
OF THE UNITED STATES.

EDITED BY
E. C. WINES, D. D., LL. D.,
SECRETARY OF THE ASSOCIATION.

ENGINEERING

NATIONAL BUREAU OF STANDARDS

REPORT OF THE NATIONAL BUREAU OF STANDARDS

E. C. WILSON, D. Sc.

1914

TRANSACTIONS.

I.—OPENING ADDRESSES—ORGANIZATION—STANDING COMMITTEES—ROLL OF MEMBERS.

The National Prison Reform Congress, called under the auspices of the National Prison Association of the United States, assembled at Masonic Temple, Baltimore, Maryland, at 8 o'clock, p. m., January 21, 1873.

The Hon. Horatio Seymour, of New York, president of the Association, took the chair in virtue of his office, and called the meeting to order.

On invitation of the president, prayer was offered by the Rev. Samuel J. Baird, D.D., of Virginia.

Governor Seymour then delivered the opening address, as follows:

GOVERNOR SEYMOUR'S ADDRESS.

The name of this association fails to give a full idea of its scope and aims. In terms, they seem to be limited to that class of men who have brought themselves under the penalties of the law. But the moment we begin to study the character of criminals and the causes of crime, we find that we are forced back to a scrutiny of our social system and of the weakness as well as the wickedness of our fellow-men. It is because the subjects of pauperism and crime thus lead to an analysis of human nature, and to the consideration of social aspects, that they have been made matters of profound thought by able publicists and large-minded statesmen. At first thought it seems that the condition of a small body of men, who have offended local laws, should be left to the thoughtful control of local authorities, but it is soon found that the considerations involved are as broad as the spread of the human race.

For these reasons, leading men of different nations were drawn together at the late International Convention, at London. For these reasons, this association was formed. Crime knows no geographical limits, no boundaries of states. It is, in its nature, at war with the welfare of the human race. It must be opposed by the united wisdom and virtue of all nationalities and of all forms of civilization.

While local laws must frame penal codes, and local societies do the work of lifting up fallen men, still much is gained by a wide-spread sympathy and co-operation. There are many things which are beyond the reach of state action, in a moral point of view; things which do not come under the cognizance of laws, but which deeply affect the welfare of our whole country.

At the first view, our efforts seem to be limited to the justice which punishes crime, and to the charity which tries to reform the criminal. But we are soon led into a wider field of duty. We are apt to look upon the inmates of prisons as exceptional men, unlike the mass of our people. We feel that they are thorns in the body politic, which should be drawn out and put where they will do no more harm. We regard

them as men who run counter to the currents of society, thus making disorder and mischief. These are errors. In truth, they are men who run with the currents of society, and who outrun them. They are men who, in a great degree, are moved and directed by the impulses around them; their characters are formed by the civilization in which they move. They are, in many respects, the representative men of a country. It is a hard thing to draw an indictment against a criminal which is not, in some respects, an indictment of the community in which he has lived. An intelligent stranger, who should visit the prisons of foreign countries and should hear the histories of their inmates, would get a better idea of the inner workings of their civilization than could be gained by intercourse with a like number of their citizens moving in the mere conventional circles of society. As a rule, wrong-doing is the growth of influences pervading the social system, as pestilences are bred by malarias. Our study into this subject soon teaches us that prisons are moral hospitals, where moral diseases are not only cared for, but science learns the moral laws of life; where it learns what endangers the general welfare of the community; what insidious pestilential vapors permeate society, carrying moral disease and death into its homes. Prisoners are men like ourselves; and if we would learn the dangers which lurk in our pathways, we must learn how they stumbled and fell. I do not doubt but some men are more prone to vice than others. But after listening to thousands of prayers for pardon, I can hardly recall a case where I did not feel that I might have fallen as my fellow-man has done, if I had been subjected to the same demoralizing influences and pressed by the same temptations. I repeat here what I have said on other occasions, that after a long experience with men in all conditions of life, after having felt, as much as most men, the harsh injustice springing from the strife and passions of the world, I have constantly learned to think more kindly of the hearts of men, and to think less of their heads.

If we find that crimes are, in a large degree, the hot-bed growth of social influences; if the weakness of human nature is always open to their attacks; if they may, at any time, enter into our homes and strike at the family circle, then we must at least guard against them as we do against the pestilence.

To protect the public health and to learn the laws of life, we build and sustain, with liberal hands, hospitals where the sick and wounded can be cured. The moral hospital should be regarded with an equal interest. In each of them we should seek to cure the inmates. In each of them we should seek to find out the secret causes of disease. With regard to both, we should always, in a large-minded way, feel that the laws of moral and physical life are a thousand times more important to the multitudes of the world at large than they are to the few inmates who languish within their gloomy walls.

The public hold in high honor the man of science who treads the walks of the hospital to relieve suffering, to find out the facts which will enable him to ward off sickness and death from others. This association appeals to the public for the same sympathy and support for those who labor to lift up their unhappy brethren from moral degradation, and at the same time to do the greater work of tracing out the springs and sources of crime, and of warning the public of its share of guilt in sowing the seeds of immorality by its tastes, maxims, and usages. We love to think that the inmates of cells are unlike ourselves. We would like to disown our common humanity with the downcast and depraved. We are apt to thank God that we are not like other men; but with closer study and deeper thought we find they are ourselves, under different

circumstances. And the circumstances that made them what they are abound in our civilization, and may, at any time, make others fall who do not dream of danger.

It is a mistake when we hold that criminals are merely perverse men, who are at war with social influences; on the other hand, they are the outgrowth of those influences. Crimes always take the hues and aspects of the country in which they are committed. They show not only guilty men, but a guilty people. The world deems those nations to be debased where crimes abound. It does not merely say that the laws are unwise, or that the judiciary is corrupt, but it charges the guilt home to the whole society. This is just; for most of the crimes which disgrace us could not be done if there was not an indifference to their causes on the part of the community. As certain plagues which sweep men into their graves cannot rage without foul air, so many crimes cannot prevail without wide-spread moral malaria. It is the greed for gold, the love of luxury in the American people, which have caused the legislative frauds, the municipal corruptions, the violations of trusts, which excite alarm in our land. It is the admiration of wealth, no matter how gained, which incites and emboldens the desperate speculator in commercial centers to sport with the sacred interests of labor, to unsettle the business of honest industry, by playing tricks with the standards of values. Those who use the stocks of great corporations as machines for gambling schemes, are more deliberately and artfully dishonest than the more humble swindler who throws his loaded dice. Many of the transactions of our capitalists are more hurtful to the welfare of our people than the acts of thieves and robbers. In the better days of American simplicity, honesty, and patriotism, these things could not have been done. No one would then have dared to face a people indignant at such rapacious greed. Such influences have led to frauds, defalcations, breaches of trust. They have filled our prisons and overwhelmed many households with shame and sorrow. Yet the authors of such things are honored for their wealth, and we ask, with eagerness, how rich do they get? and not, how do they get riches?

To make the public feel that criminals are men of like passions with ourselves, that crime is an infectious as well as a malignant disease, and that its sources are not so much personal inclination as general demoralization, are the great first steps toward reform. When we feel that disease may enter our own houses and seize upon the mental or moral weaknesses of those we love, we are ready to study its causes and its workings. We should then uphold and honor those men of humanity and true statesmanship who study out the causes of moral stains, as we honor and support those men of science who search out, in sick-rooms or hospitals, the causes and courses of the complaints which kill the body.

He who masters the diagnosis of crime gains a key to the mysteries of our nature and to the secret sources of demoralization, which opens to him a knowledge of the great principles of public and private reform, the true methods of a good administration of laws. Pauperism and crime have been made the subjects of earnest thought by the best and wisest men of the world, not only on account of their intrinsic interest, but also on account of their relationship to all other matters of good government. Neither of them can be driven out of existence; they will always be problems to vex statesmanship; but they must always be battled with. In the social edifice they are like fires, ever kindling in its different parts, which are to be kept under by watchfulness and care. If neglected, they burst out into the flames of anarchy and revolution, and sweep away forms of government.

These subjects must be studied directly and in their moral aspects. There is a pervading idea in our country that the spread of knowledge will check crime. No one values learning more than I do, but it is no specific for immorality and vice. Without moral and religious training, it frequently becomes an aid to crime. Science, mechanical skill, a knowledge of business affairs, even the refinements and accomplishments of life, are used by offenders against law. Knowledge fights on both sides in the battle between right and wrong, at this age. It lays siege to banks; it forces open vaults stronger than old castles; it forges and counterfeits. The most dangerous criminal is the educated, intellectual violator of the law, for he has all the resources of art at his command—the forces of mechanics, the subtleties of chemistry, the knowledge of man's ways and passions. Learning, by itself, only changes the aspect of immorality. Virtue is frequently found with the simple and uneducated, and vice with the educated. Surrounded by glittering objects within their reach, our servant girls resist more temptations than any class in society.

We must look beyond the accidents of knowledge or ignorance, if we wish to learn the springs of action. To check vice there must be high moral standards in the public mind. The American mind must move upon a higher plane. To reform convicts, their hopes must be aroused and their better instincts worked upon. I never yet found a man so untamable that there was not something of good on which to build a hope. I never yet found a man so good that he need not fear a fall. Through the warp and woof of the worst man's character there run some threads of gold, and in the best there are base materials. It is this web of entwined good and evil in men's character which make the problems and perplexities of the legislator and judge.

While there is no honest dealing with this subject unless the American people are charged with their share of guilt, and while Christian charity leads us to take the kindest view we can of every man, it does not follow that crime should be dealt with in a feeble way. Let the laws be swift, stern, and certain in their action. What they say, let them do; for certainty, more than severity, carries a dread of punishment. Let the ways of bringing offenders to justice be direct, clear, and untrammelled. The technicalities of pleading, proof, and proceedings, in many of our States, are painfully absurd. To the minds of most men, a criminal trial is a mysterious jumble. The public have no confidence that the worst criminal will be punished; the worst criminal cherishes, at all times, a hope of escape. In every part of our country there is a vague idea that certain men, of legal skill, can extricate offenders without regard to the merits of their case. This is a fruitful cause of crimes. There is not, in the minds of the American people, a clear, distinct conception of our penal laws, their actions, and their results. Not less hurtful to justice are those fluctuations of the public mind, which shakes off, spasmodically, its customary indifference; fiercely demands a conviction of those who happen, at such times, to be charged with crime; and thus makes popular clamor take the place of judicial calmness and impartiality.

No one feels that there is, in this country, a clear, strong, even flow of administration of criminal laws. The mood of the popular mind has too much to do with judicial proceedings.

The evils connected with the administration of justice in our land are due, in a good degree, to the swift changes in the material condition of our country. An increase of our numbers of more than a million each year, of more than twenty-five hundred each day, of more than one hun-

dred each hour, explains many of the causes of our overburdened system of penal laws, framed for a different state of society. Our perplexities are increased by the fact that more than one-quarter of this daily addition to our population is made up of those who come from other countries, strangers to our customs and laws, and, in many instances, ignorant of our language.

History gives no account of such vast increase of the numbers of any country by constant, peaceful accretion. Conquest rarely makes as many prisoners of war as we make captives to the peaceful advantages of our continent. They bring us wealth and power; they also bring us many problems to solve. British laws deal with British subjects. French courts decide upon the guilt or innocence of Frenchmen. Germany shapes, by its usages and customs, the ideas of right and wrong in the minds of the Teutonic races. But we, in America, have to deal with and act upon all nationalities, all phases of civilization. While these facts palliate the defects of our penal laws and of their administration, they certainly make more clear and urgent the duty which demands that we keep pace with the swift changes going on around us. More than this, our circumstances enable us to take the lead in the great work of reform, as we deal with more plastic materials than are found in the fixed condition of older nations. Here, too, we have a broader field, filled with men of varied phases and aspects of different civilizations, in which we can study the wants and weaknesses, the virtues and vices of the human race.

For a series of years, nearly three hundred thousand emigrants have been annually landed at the harbor of New York. Disorder and crime are always active along the line of march of great armies. I believe there is no instance in history of a movement of the human race so vast and long continued. I am glad to state a fact which in some degree palliates the disgrace which attaches to the administration of justice and the conduct of public affairs in that great city. But I should fall short of telling the whole truth if I did not also say that the discredit of that great city mainly springs from the sad fact that its men of wealth, as a body, lack that genuine self-respect which leads to a faithful, high-minded performance of the duties each citizen owes to the public.

Is there any other basis upon which we can found this great work of patriotism and philanthropy than the one contemplated by this association? It may, at first view, seem to be limited to a small class, but it opens up into a broad field of unpartisan, unsectarian labor. The objects we have in view, although they make our prisons their starting-point, are so wide in their bearings that they brought together, at the London international association, in the interests of our common humanity, men of the best minds, from most of the countries of Europe and America. These, in despite of their differences of creeds, usages, language, and form of civilization, could act in accord in devising measures to lift up the fallen, and to spread the principles of morality and justice among the peoples of the world. It is found that true statesmanship, like true religion, begins with visiting the prisoners and helping the poor.

It is certain that in our own country Edward Livingston, the public man who ranks highest in European regard for intellectual ability, gained his position by his great work, "The Penal Laws of Louisiana." When it was the fashion in the scientific world to hold that men and animals were dwarfed on this continent, this work was brought forward by our friends in Europe as a proof that statesmanship was full-grown here. It is a remarkable fact that an able foreign writer selected the Louisiana code and the proclamation of General Jackson against the

doctrine of secession as the two ablest productions of the American mind, not knowing that they both came from the same pen. An exposition of Mr. Livingston's system has lately been published in France, under the auspices of the French Institute, by M. Charles Lucas, a member of the Institute, and formerly president of the council of inspectors of the penal institutions of that country. M. Lucas is a distinguished writer and leader in the work of criminal reform. He belongs to that body of large-minded, philanthropic men who seek to benefit humanity by wise systems of legislation. A certain breadth and reach of mind mark all those men who have entered upon the study of penal laws and the reformation of criminals.

The Louisiana code is not only remarkable as the product of one man's mind—and I know of no like instance in history—but it is also distinguished by the fact that its republication is called for after the lapse of half a century. The new edition has an able introduction by Chief Justice Chase. Only fleeting honors are gained by those who deal with the passing phases of society, while enduring honors are won by those who grasp the lasting problems of government and laws. It is to be hoped that our statesmen will learn to follow in the higher pathways marked out by Mr. Livingston.

While there is much to condemn in our system of laws and their administration, there is much to admire in the practical workings of many of our prisons. In some respects we are in advance of other peoples. Much has been done in many of our States to improve the condition of criminals, and much more to rescue the young from courses of vice and destruction. I should be glad to speak of the instances of ability and self-devotion shown by men who have charge of public or private charities established for the reformation of offenders. They would lend a weight to my argument which my reasoning cannot give. But I must leave these things to be brought out by the discussions of this congress. I only seek to show the ends at which it aims. I only seek to invoke for it the sympathy and support of the public in its efforts to combine and organize the forces of those who, in different parts of our country, are working in this field of philanthropic and patriotic labor.

Crime has its origin in the passions which live in every breast and in the weaknesses which mark every character. In its nature it concerns each of us as clearly as the common liability to fall prematurely before disease and death. No man can know human nature, no man can be a great teacher to his fellow-men, no man can frame laws wisely and well, who has not studied character in convict life. There he can best see the lights and shadows of our nature; see in strongest contrasts what is good and what is bad.

The prisons, to which all vice tends, are the points from which the reforms can best be urged which seek to find out where vice begins. Starting from the sad ends of crime, and running back along their tracks, it is seen that in a large degree they are engendered by public tastes, habits, and demoralizations. It is in our prisons that we can best learn the corrupting influences about us which lead the weak as well as the wicked astray; ay, and sometimes make the strong man fall into disgrace and misery.

In these moral hospitals the thoughtful man, the philanthropist, and the statesman will look for the causes of social danger and demoralization. When we begin at the prison and work up, we find opening before us all the sources of crime; all the problems of social order and disorder; all the great questions with which statesmanship, in dealing with the

interests and welfare of a people, must cope when it seeks to lift up high standards of virtue and patriotism.

In the most highly civilized countries, the subjects of pauperism and crime secure the most attention and thought. They turn men's minds from selfish to unselfish fields of labor. Those who enter those fields will find in them marks of toil and care by the best human intellects. The grandest minds have worked at their intricate problems. The ambition of the first Napoleon sought to gain immortality in his code of laws as well as in victories on the field of battle.

Much has been done, in many of our States, to improve prison discipline. Something has been done toward reforming prisoners; but the larger view of the subject, which looks to the moral health of society and the baleful influences at work in its organization, has not received the attention which it deserves.

When prisons are visited by men of mind, when prisoners are looked upon with kindly eyes by those who can study their characters and learn from them the virtues, the vices, and the wickedness which mark our race, and who, tracing back the courses of their lives, shall find the secret sources of their errors and their crimes, then we shall have not only our laws justly enforced and reform wrong-doers; but, more and better than these, we shall gain a public virtue and intelligence which will secure the safety and happiness of our homes, the glory and stability of the republic. Then wealth gained by unworthy means will no longer be respected.

No one can recall the events of the past few years, particularly those of the great commercial centers, without feeling that there is an ebb-tide in American morals. Not a little of the glitter of our social and business life is the shining of putrescence. Fungous men have shot up into financial prominence, to whom a pervading, deadening moral malaria is the very breath of life. They could not exist without this, any more than certain poisonous plants can flourish without decaying vegetation.

While I have tried to present in clear terms the claims of this association upon the public sympathy and support, it must be understood that we claim for it only the merit of being a useful auxiliary to moral and religious teachings. If those who take part in its work should fall short of its broader, higher objects of a national character, they will at least get this great gain—they will learn to think more humbly of themselves, more kindly of their fellow-men, and to see more clearly the beauties of Christian charity.

MR. JONES'S ADDRESS.

The Hon. Isaac D. Jones, late attorney-general of Maryland, welcomed the members of the congress in the following remarks:

MR. PRESIDENT, MEMBERS OF THE NATIONAL PRISON ASSOCIATION, AND ALL WHO HAVE ASSEMBLED IN THIS CITY TO ATTEND THE PRISON REFORM CONGRESS: On behalf of the Prisoners' Aid Association of Maryland, and of all our citizens, I have been requested to extend to you the right hand of fellowship; to offer you, in their name, a cordial reception, and to bid you a most hearty Maryland welcome. This pleasant duty had been assigned, as was most fit, to our distinguished and eloquent fellow-citizen, his excellency the governor of Maryland. I am sure all will unite with me in regret that the condition of his health has deprived us of the honor of his presence, and *him* of the pleasure of meeting you on this occasion, as I am sure he would have done, with a most cor-

dial greeting. You need no assurance from me of his sympathy or of his readiness to render all the aid in his power in accomplishing the good work in which you are engaged. It is indeed a good work ; a great and important work ; a noble charity and Christian duty. The congress of representatives of many of the most important nations of the earth, which met in London in July last, indicated the deep interest which has been aroused throughout the civilized world in the success of this work. It involves one of the most difficult and yet vital problems connected with the administration of civil government. It grows in importance and extent the more you contemplate it. Beginning with those now in prison under condemnation and sentence, and considering what can be done toward impressing them with a proper sense of their crime, and the duty of repentance and reformation, and how, if possible, they may be restored to useful, honest citizenship ; then looking into the criminal code, and pondering its provisions and its administration in our courts and by our juries, and remedying, as far as possible, such defects in both as may be discovered, a far more extensive field is opened to the inquiry, what can and must be done to resist the swelling tide of crime, and to prevent its sweeping away the barriers which protect not only property, but the security of our homes, the quiet, peace, and safety of social life, and even life itself, and to induce all classes of our people to lead honest, industrious, sober, and useful lives ? It is too plain to observation and experience for any doubt, that the principal sources of this destructive flood of vice and misery are ignorance and idleness. What shall be the remedy for these ? Where and with whom shall we begin with the best prospect of success ? Undoubtedly with those who are young and as yet uncontaminated. And as to these, have all the experience of the ages and the boasted discoveries of modern science found out anything better than the good old proverb, "Train up a child in the way he should go ?"

And then comes the question, How and by whom shall he be trained ? What are the duties of parental training ; what the duty of the State in providing the most efficient system of education ? And, most important of all, upon what foundation shall the superstructure of education be erected ? I beg pardon for having, I fear, already gone beyond the limits assigned me. But as my heart is deeply impressed with the solemn importance of the subjects, at which I have merely hinted, I beg most respectfully, in this presence—where so many of the men of thought, men deservedly high in the public confidence, and in the councils of our country, are assembled—to declare my most solemn and profound conviction that any system of education which does not include the recognition of the existence and attributes of the God of the Bible, and of man's moral responsibility as an immortal being, will utterly fail to "train up a child in the way he should go ;" will utterly fail to impress the youthful mind with that reverence for truth, purity, justice, and right, and for the laws of God and of his country, which shall render him a good, law-abiding citizen.

And now, Mr. President, renewing the assurance of a most cordial welcome, permit me to express the hope that your stay with us may be pleasant, and that the deliberations of the prison congress may lead to the best results.

MR. KERR'S ADDRESS.

The Hon. Mr. Kerr, M. C., of Indiana, in responding to the welcoming address of Mr. Jones, said :

MR. PRESIDENT : When the executive of Indiana commissioned me as

a delegate to this body, he invited me to duties which I consider most honorable and important. My only regret is, that the exacting duties of service in another Congress compel me to decline their performance, beyond attendance upon this opening meeting.

The interest and safety of society demand, primarily, that crime shall be restrained and punished. There is no element in criminal administration that contributes so effectively to hold in check the criminally disposed as the *certainty* of punishment. Nothing tempts the wicked more strongly to the perpetration of crime than the hope of escape with impunity. It is, therefore, the obvious duty of every citizen to aid in whatever way he has opportunity to maintain and increase the *certainty* of the faithful execution of the law's judgments. Even an imperfect criminal law thus enforced will prove more salutary in its influence upon society than a good and wise law loosely, haltingly, or fitfully executed. I believe the experience of all countries and governments verifies these propositions. It results as our duty, that, in all our efforts to promote reforms in connection with the administration of criminal law, we should studiously avoid any policy that would tend to defeat the operation of these essential principles.

But while *certainty* of execution is essential to the success of criminal law and the protection of society, it is equally important that the just and impartial judgments of the law shall be executed upon the offender in the spirit of rational sympathy and mercy. The aim of all laws should be to punish and improve. Society has no right to enforce its punitive decrees with cruelty or torture. Such agencies do not tend to reform, but to humiliate, to enrage, to crush, to brutalize. If punishment alone be the object of the law, it cannot be best attained by such means. If you would sharpen the edge or intensify the sting of public punishment, you must cultivate the sensibilities, the conscience, the moral perceptions of your victim. The brutal man cannot suffer in any beneficial or reformatory sense. The state whose punitive policy tends to brutalize its offenders becomes itself an enemy of society in an important sense. In truth, civilized and Christian society should never cease to remember that, "'tis excellent to have a giant's strength, but tyrannous to use it like a giant." A brutalized convict, set free, is a worse man than before, and more disposed than ever to prey upon society; but if the offender be treated, during imprisonment, as a moral and rational creature, capable of being made better, a very different and much better result will follow. The temporary loss of personal liberty is exacted of the wrong-doer for the safety of society; but imprisonment cannot continue always. Therefore, even intelligent selfishness, as well as humanity, demands that, during confinement, the offender, if possible, be made a better man. In almost all cases this can be done.

The inherent enormity of crime ought never to be denied or palliated to the criminal, or reduced in the popular estimation, but rather magnified, as of necessity it will be just in proportion to the increased enlightenment of the individual and of the popular judgment and conscience. Yet it becomes legislators and prison officers to bear always in mind, that, in the evil antecedents and surroundings of birth, in the law of hereditary descent, in the misguiding influences of evil associations, of ignorance, of abject poverty, and of social neglect and ostracism, there are to be found many suggestions that should excite an earnest sympathy and a merciful forbearance. In subordination to the safety and purity of society the offender should have the full benefit of these suggestions. They appeal in his behalf to the best impulses of enlightened and just men. It is not improper or injurious in any way, nor

does it savor of undue sentimentalism to award to the criminal, in his prison treatment, the advantages which result from these considerations.

They forbid any system of treatment which does violence to obvious laws of health, or of healthful action of mind or body, within prison limits, or to the admitted laws of human improvement. A man diseased, or a man filled with dogged anger, or made morbid by solitary confinement, or wounded in his self-esteem by harsh or brutal treatment, is in a poor frame of mind to receive kindly, or to be impressed by, any formal instructions or admonitions. Indeed, under such circumstances, it is safe and logical to assume that all efforts for moral improvement of the convict are simply wasted. The great law of kindness, of humane interest and intelligent sympathy, can alone temper authority with instruction in such manner as to guarantee the best results. This is the constant experience of intelligent beings in all the relations of daily life. Why, then, shall not these benign principles be admitted within the prison walls? If improvement is to be the result of punishment, they may not, must not be excluded. If, indeed, the object of society is to transform our penitentiaries into moral pest-houses, and to add fuel to the base passions of their inmates, then eliminate these God-like and merciful principles, and leave cold, harsh, untempered, naked authority to rule and ruin. But it is not thus that the wise and good should desire, or can afford, to govern the bad. The primary object of all punitive discipline, after confinement at healthful, useful, and regular labor, should be the reformation of the criminal. This is required by the highest interests of society, by the dictates of the truest civilization, by the best teachings of religion, and by the unconscious appeals of the poor, ignorant, or stolidly wicked violators of law. The silent supplication of sinful and fallen humanity to its rulers is for light and strength, for education of the head and heart, for the cultivation of latent virtue, for the revival of neglected and abused manhood, and for the restoration of self-respect, to the end that, when the State shall bid the convict resume his personal liberty, he may also possess the morality, courage, and intelligence necessary for self-government. The intrinsic excellence of a system which secures these results in any substantial degree is above all comparison with any system of mere authority. It may be said that these results are not attainable in all cases. I admit it; but even the most desperate offenders are not insensible to the influences of kindness, justice, and good example. These elements, whenever illustrated in prison government by the officers, will surely command the respect of the inmates, however bad they may be, and will therefore certainly exercise a more reformatory influence than the policy of force, or fear, or the lash. I would not have these principles carried out in prison government from any mere maudlin or humanitarian sentiment of sympathy with criminals, the enemies of society and law, but rather out of a desire to promote the highest aims and noblest objects of both society and law. By such treatment of the bad I would increase the essential welfare and security of the good. Then such discipline of the wicked would react upon their associates in society, and become an additional aid in the prevention of crime.

Do you ask me what our country now most needs to give impetus and power to true and permanent penitentiary reform? I answer that, in my judgment, it is the organization of our prison governments in the persons of honest, practical, well-poised, cultivated, humane, and earnest men; not mere *doctrinaires* or dreamers, not devotees of peculiar systems or special crotchets; but practical men, men of affairs, of courage, of education, of a high grade of manhood, and of generous impulses as well as

incorruptible integrity. Here, then, is a new field and a good one, much neglected heretofore, for useful and beneficent civil-service reform. I hope you will, with emphasis, call the attention of our law makers and appointing powers throughout the States to its importance, and invoke their intelligent aid in its accomplishment. Bad or corrupt men, placed in control of convicts, speedily become worse themselves, and are quite powerless to improve others. The relation affords a severe test of character even in the best. Good and true and brave men alone should be given such a command. The influence of strong will, just character, and high moral tone in officers, is at once apparent upon the offenders. The latter are seldom so base as not to appreciate and respect such officers, and be beneficially influenced by their supervision, example, and instruction. The importance of having such officers cannot be overestimated.

Prison discipline, to be most effective and fruitful of good, should always have a discriminating relation to the antecedents, the personal qualities, the mental capacity, and the moral development of the individual offenders. Otherwise there will be little ground for hope of true and lasting reform. Therefore the law should require prison officers to be supplied with faithful reports of whatever is known touching the careers of convicts. Then officers will be enabled to make more judicious classifications, to apply discipline and instruction with intelligent reference to individual needs and conditions, and to protect prisoners from the evil results of unsuitable or improper associations. How indispensable it is for the attainment of all these good and worthy aims, that all prison officers be absolutely trustworthy and suitable men. If they are not, no amount of wisdom in the law makers, or in the mere letter of the statute, can accomplish the desired results. If they are, they will not fail to accomplish very great good even under imperfect and vicious laws, for they will be wiser and better than the statute, and, without violating it, they will obey the better impulses and requirements of enlightened humanity. The friends of prison reform may, therefore, do great good by earnest agitation in favor of the appointment of better and more suitable men for prison rulers.

It is most ungenerous trifling with the best interests of society and of unfortunate human beings to select prison officers from political or partisan motives. Personal fitness and qualifications alone should be the test. Party politics have no business in penitentiaries any more than in Sabbath-schools or insane asylums. They are bad enough in Congress. I don't mean this congress, but that more pretentious institution over at Washington. If you would establish a new claim, therefore, upon the public gratitude, see to it that politics be kept out of prison government. The higher motives and precepts of unselfish philanthropy and Christian charity should preside in such institutions.

MR. HAGEMAN'S REMARKS.

The president called on Mr. John F. Hageman, of New Jersey, for remarks, who said that he did not know why he had been thus distinguished, unless it was that he came from New Jersey, a State which executes her laws, and where there is no connivance between courts and juries, and where juries do not hesitate to convict when the facts warrant such a verdict. Yet, for all that, New Jersey believed in prison reform and a reformatory prison discipline, and was in full sympathy with the objects and work of this congress, and of the National Prison Association, at whose call it had been convened. He said that religious in-

struction and church services were employed with the best results in the prisons of his State. Industrial labor was also found a highly reformatory agency. He might be wrong, but he did not approve of the system of unbroken silence observed, theoretically at least, in most of the prisons. Talking did men a great deal of good. Outside workers, Christian men and women of judgment and piety, must be admitted, under proper restrictions, into our prisons; secular schools and Sunday-schools should be established in them. Our reformatory agencies must be enlarged and made more comprehensive.

APPOINTMENT OF COMMITTEES.

The following standing committees were then, on motion, appointed by the chair:

Committee on Permanent Organization.—Hon. P. T. Miller, of Missouri; Rev. T. K. Fessenden, of Connecticut; J. Merrefield, of Maryland; Colonel Burr, of Ohio; J. M. Talcott, of Rhode Island; Dr. Wright, of Tennessee; and Mr. Powell, of New York.

Business Committee.—Hon. C. I. Walker, of Michigan; Dr. Wines, of New York; Rev. A. Woodbury, of Rhode Island; Dr. E. W. Hatch, of Connecticut; G. S. Griffith, of Maryland; Samuel Allinson, of New Jersey; and H. Thane Miller, of Ohio.

Committee on Finance.—Murray Shipley, of Ohio; Hon. Edward Earle, of Massachusetts; John E. Develin, esq., of New York; W. R. Lincoln, of Maryland; Hon. G. W. Hall, of Pennsylvania; Hon. Frederick Smyth, of New Hampshire; and Hon. Cyrus Mendenhall, of Kentucky.

Committee on Credentials.—Wm. A. Wisong and J. H. Brown, of Maryland; and Rev. J. L. Milligan, of Pennsylvania.

ORGANIZATION OF THE CONGRESS.

The Committee on Permanent Organizations subsequently reported, and the congress was organized with the following officers:

President.—Hon. Horatio Seymour, New York.

Vice-Presidents.—Dr. E. W. Hatch, Connecticut; Charles E. Felton, Illinois; Hon. M. C. Kerr, Indiana; S. H. Craig, Iowa; Hon. K. F. Pritchard, Kentucky; G. S. Griffith, Maryland; Hon. Edward Earle, Massachusetts; Hon. C. I. Walker, Michigan; Professor W. F. Phelps, Minnesota; General B. B. Eggleston, Mississippi; General James L. Miner, Missouri; Hon. Frederick Smyth, New Hampshire; John F. Hageman, esq., New Jersey; H. W. Bellows, D. D., New York; Colonel Raymond Burr, Ohio; Hon. Richard Vaux, Pennsylvania; General N. Viall, Rhode Island; General C. J. Stolbrand, South Carolina; Dr. W. M. Wright, Tennessee; S. J. Baird, D. D., Virginia; Hon. Thomas Sweeney, West Virginia; Hon. Alexander Mitchell, Wisconsin; F. W. Howe, District of Columbia; A. P. Rockwood, Utah.

Secretaries.—H. A. Monfort, Ohio; Dr. J. C. Carpenter, District of Columbia; Rev. William Quinn, New York.

Treasurer.—Murray Shipley, Ohio.

Official Reporter.—Rev. Wm. H. Tiffany, New York.

ROLL OF MEMBERS.

The Committee on Credentials subsequently reported the following roll of members:

ALABAMA.—Not represented.

ARKANSAS.—Not represented.

CALIFORNIA.—Not represented.

CONNECTICUT.—Dr. E. W. Hatch, superintendent State reform school, West Meriden; David P. Nichols, president of board of trustees State reform school, Danbury; George Langdon, trustee State reform school, Plymouth; Hiram Foster, secretary of board of trustees State reform school, West Meriden; Rev. Geo. W. Wooding, chaplain of state prison, Wethersfield; Rev. I. H. Bradford, superintendent of girls' industrial reform school, Middletown; H. D. Smith, trustee of girls' industrial reform school, Plantsville; Rev. Thos. K. Fessenden, (executive appointment,) Farmington; Hon. Henry Barnard, Hartford.

DELAWARE.—Not represented.

FLORIDA.—Not represented.

GEORGIA.—Not represented.

ILLINOIS.—Charles E. Felton, superintendent of house of correction, Chicago.

INDIANA.—Hon. Michael C. Kerr, M. C., New Albany.

IOWA.—S. H. Craig, warden of state prison, Fort Madison.

KANSAS.—Not represented.

KENTUCKY.—Hon. K. F. Pritchard, (executive appointment,) Cattlesburg; Dr. J. F. South, (executive appointment,) Bowling Green; Hon. J. T. Gray, (executive appointment,) Louisville; Cyrus Mendenhall, Newport; Hon. R. K. White, manager of house of refuge, Louisville.

LOUISIANA.—Not represented.

MAINE.—Not represented.

MASSACHUSETTS.—Rev. Marcus Ames, superintendent of industrial school for girls, Lancaster; Hon. Edward L. Pierce, secretary of board of State charities, Boston; Hon. Edward Earle, member board of State charities, Worcester; Hon. Benj. Evans, superintendent State reform school, Westborough.

MARYLAND.—G. S. Griffith, president prisoners' aid society, Baltimore; Rev. Penford Doll, agent prisoners' aid society, Baltimore; Professor T. D. Baird, Samuel Townsend, Richard Janney, Chas. W. Slagle, J. Harman Brown, Wm. A. Wisong, Ira C. Canfield, Jos. Merrefield, members prisoners' aid society, Baltimore; Thos. S. Wilkinson, warden of penitentiary, Baltimore; Henry Seim, director of penitentiary board, Baltimore; R. V. Page, clerk of penitentiary board, Baltimore; J. H. Irvin, warden of city jail, Baltimore; A. W. Duke, visitor of city jail, Baltimore; W. R. Lincoln, superintendent of house of refuge, Baltimore; L. A. Byerly, director of house of refuge, Baltimore; J. S. Lincoln, superintendent of boys' home, Baltimore; William Palmer, agent of the Henry Watson children's aid society, Baltimore; Mrs. Penfield Doll, assistant agent of prisoners' aid society, Baltimore.

MISSISSIPPI.—General B. B. Eggleston.

MISSOURI.—General Jas. L. Miner, (executive appointment,) Jefferson City; Hon. P. T. Miller, (executive appointment,) Jefferson City; Miss Linda Gilbert, Saint Louis; Mrs. A. W. Richardson, Saint Louis.

MICHIGAN.—Hon. C. I. Walker, chairman board commissioners penal and charitable institutions, Detroit; Rev. Chas. Johnson, superintendent of reform school, Lansing; Hon. J. I. Mead, member of board of reform school, Lansing.

MINNESOTA.—Professor Wm. F. Phelps, president State normal school, Winona; Hon. E. G. Butts, inspector State prison, Stillwater; H. A. Jackman, warden State prison, Stillwater; Mrs. S. B. Jackman, Stillwater.

NEBRASKA.—Not represented.

NEVADA.—Not represented.

NEW HAMPSHIRE.—Hon. F. Smyth, ex-governor and president prisoners' aid association, Manchester; Allen Folger, member prisoners' aid association, Concord.

NEW JERSEY.—John F. Hageman, esq., district attorney, Princeton; L. H. Sheldon, superintendent State reform school, Jamesburg; Mrs. L. E. Dodge, matron of girls' industrial school, Trenton; Samuel Allinson, member of board of State reform and girls' industrial schools, Yardville.

NORTH CAROLINA.—Not represented.

NEW YORK.—Rev. Dr. H. W. Bellows, vice-president national prison association, New York; Rev. Dr. Wines, secretary national prison association, New York; Mrs. Wines; Rev. W. H. Tiffany, official reporter, Stony Creek; Aaron M. Powell, national temperance society and publication house, New York; Hon. John E. Develin, member board managers of Catholic protectory, New York; Rev. William Quinn, advisory chaplain of Catholic protectory, New York; Brother Teliow, rector of Catholic protectory, New York; George B. Cline, Roselyn.

OHIO.—Col. Raymond Burr, warden of penitentiary, Columbus; H. S. Monfort, superintendent of house of refuge, Cincinnati; H. Thane Miller, esq., director of house of refuge, Cincinnati; Murray Shipley, director of house of refuge, Cincinnati.

OREGON.—Not represented.

PENNSYLVANIA.—Hon. Richard Vaux, president of board of inspectors, eastern penitentiary, Philadelphia; George W. Hall, member of Philadelphia prison society, Philadelphia; Edward H. Coates, member of Philadelphia prison society, Philadelphia; Thomas A. Robinson, Philadelphia Magdalen society, Philadelphia; Dr. Joseph Parrish, president of association for the cure of inebriates, Media; T. J. Big- ham, president of reform school board, Pittsburgh; Rev. J. L. Milligan, chaplain of western penitentiary, Allegheny; George Albree, director of Allegheny County workhouse, Pittsburgh; J. D. Carlisle, Allegheny County prison society, Pittsburgh; Rev. W. A. Fuller, chaplain of Allegheny County workhouse, Claremont; J. P. Fleming, director Allegheny County workhouse, Pittsburgh; George R. White, director Allegheny County workhouse, Pittsburgh.

RHODE ISLAND.—General N. Viall, warden of state prison, Providence; Rev. Augustus Woodbury, president board of state prison inspectors, Providence; James M. Talcott, superintendent of reform school, Providence.

SOUTH CAROLINA.—General C. J. Stolbrand, warden of State prison, (executive appointment,) Columbia.

TENNESSEE.—Dr. W. M. Wright, inspector of state prison and branches, Nashville.

TEXAS.—Not represented.

VERMONT.—Not represented.

VIRGINIA.—Rev. Dr. S. J. Baird, Waynesborough.

WEST VIRGINIA.—Hon. Thomas Sweeney, Wheeling; Thomas P. Shallcross, warden of state prison, Moundsville.

WISCONSIN.—Not represented.

TERRITORIES.

DISTRICT OF COLUMBIA.—F. W. Howe, superintendent reform school, Washington; Dr. J. E. Carpenter, trustee of reform school, Washington.

UTAH.—A. P. Rockwood, warden of penitentiary, Salt Lake City.

FOREIGN COUNTRIES.

FINLAND.—Dr. Felix Heckle, Helingsfors.

II.—ANNUAL REPORTS OF SECRETARY AND STANDING COMMITTEES OF THE NATIONAL PRISON ASSOCIATION.

1. REPORT OF THE SECRETARY.

The undersigned respectfully offers for his second annual report as Secretary of the National Prison Association, the report which he had the honor to submit to the President of the United States as commissioner of the Government to the International Penitentiary Congress of London, and which is printed in the preceding part of the present volume.

E. C. WINES,
Secretary.

2. REPORT OF THE EXECUTIVE COMMITTEE.

The aim of the executive committee in the present report is to set before the national prison association and the people of the United States certain views relating to prison management, whose prevalence in society they deem of the highest importance—views which must take hold of the general public before any practical application of them will be allowed in our prison administration. These principles are doubtless familiar to the delegates to this congress, but not *too* familiar, and certainly not too *operative* even with them; and we know they will excuse some reiteration of commonplaces, for the sake of the end in view, which is the unfolding of those principles of human nature, in the light of which prison science can alone safely and steadily advance. We offer, then, nothing local, circumstantial, or historical; nothing specifically American; and nothing directly connected with the work of the past year, but only an unfolding of certain ideas and principles deemed vital to our cause.

Some twenty years ago Captain Alexander Maconochie, an English naval officer, and a man of exceptional insight into the laws of human nature, with a transcendent desire to aid its worst specimens to conquer their vices and weaknesses, conceived and carried out a scheme for the reform of prisoners and convicts, in the penal colony at Norfolk Island, Australia, and subsequently of the juvenile prisoners in Birmingham jail, England, which, although well known among students of prison discipline, is just beginning to attract the attention of the general public. Sir Walter Crofton adopted and improved upon Maconochie's suggestions, and inaugurated a similar system in Ireland, where it has become the admiration, example, and chief hope of all practical students of the new social science of prison discipline.

There was published, in the annual report of the association for 1871, a *résumé* of the principles of Maconochie's system, made by Dr. Wines, the learned, devoted, and persistent leader of American reformers in prison discipline. This admirable essay contains more to instruct and encourage the friends of criminals, and the hopes for an improved human society, than anything elsewhere to be found, excepting the original papers which furnished the ground-work of it. Before stating what those principles are, when traced to the root from which they spring, we wish to draw attention to a less usual view of the importance of the study of prison discipline, as a general study of human nature, reflecting immense light, not easily obtained by any other process, upon the whole science of education, domestic discipline, training for life, and even the administration of religion. Students in medicine know the vast importance of the opportunities afforded by public hospitals

for the study of the laws of health, and the conditions of cure in general practice. Morbid anatomy, too, throws valuable light upon the organs and functions of health. Insane asylums have become schools of study for psychologists; and the laws of reason and the discipline of intelligence and will are better understood by the careful study of abnormal fancies and deranged minds. In like manner, a profound consideration of the dispositions and tendencies that lead to crime, made in reformatories and prisons, reveals the errors of our domestic training, exhibits the prevalent faults of our school discipline, and throws a clear light on the defects of our social system. A study of the crude character, low tendencies, paralysis of will, morbid imagination, stupefied conscience, and gross sensuality of the criminal class, brought under prison restraint, opens a profound view into the working of our whole social system, points to the weak spots in our common nature, exhibits the defects in the laws and administration of our system of government, and shows how ill-formed is the public opinion that rules communities.

Without formally arraiguing society, or beating the air with complaints that have no definite end, in the attempt to remove difficulties connected with the condition of prisoners, principles are developed, rights brought out, and facts disclosed, which must inevitably, sooner or later, produce wide changes in the whole conception of this subject—changes which will prepare for radical reforms in general education, family discipline, and the whole life of society.

We do not propose to state Captain Maconochie's principles—which may now be considered the accepted principles of all competent dealers with the subject of prison discipline—in his own words, nor in the multiform division into which they fall in Dr. Wines's essay. We wish rather to strike at the root-principle of them all, and then to follow the trunk up to its few chief branches. We must keep principles and methods distinct, and it is a defect of Captain Maconochie's mind, and perhaps a necessity of Dr. Wines's purpose, that this is not done by either. The principles and the methods are both apparent enough in the account. But methods are constantly put in place of principles; and, indeed, Dr. Wines's title is a little misleading, and would be amended by calling his essay Maconochie's method of prison discipline. For instance, the mark or credit plan, which is his *first principle*, is really only a method founded on a principle. The principle is this, that hope is just as essentially and vitally at the root of all true prison discipline as at the root of all free human life. Extinguish *hope* in human society or in a single human bosom, and you strike a death-blow at the will, the conscience, and the understanding. Nothing so fatal in the action of government or in the political, social, economic conditions of a people, as the depression or extinction of hope. Governments and social organizations may be measured and graded, as regards their merits, by the degree in which hope exists among the people at large. It is the quality which exerts the largest, most constant, most stimulating and sustaining influence upon the one universal humanity. What light and heat are to the vegetable world, and what the opportunity is to plants to rise freely in the wooing air, hope is to human affections, faculties, and will. It is the absence of hope, indeed, which, more largely than anything else, makes criminals; for the immense obstacles which oppressive or unequal social and political institutions create to the following of honest paths of remunerative industry, drive the irresolute, the self-indulgent, and the less moral to what they mistake for the more open and immediately promising career of crime.

It being established that the old principle adopted from the entrance

to Dante's Inferno, "Let all who enter here abandon hope," which for ages had stood over the gate of the prison, is contrary to every law of human progress and elevation, Captain Maconochie, in effect, put in its place, "And now abideth hope" for prisoners and convicts, as well as for all God's creatures. This is really his fundamental principle, and it is worthy of its place at the root of his glorious scheme.

But in adopting this principle, of course the old idea of vindictive or even exemplary punishment, as the first end of penal law and practice, is at once torn from its supremacy. Of course, also, the immediate safety of free society being the sole object of criminal law, jails and prisons were originally built to disarm dangerous members of society of the power to harm it. Safely lodged there, they were to be punished vindictively for the injuries they had caused: first, because they deserved it, and justice was supposed to be thus promoted; and, second, to warn and deter others from following their example. It was at last discovered—and strange it is that it took so long to find it out—that the main object sought, the safety of free society, was not effectually secured by this method; that its cruelty and selfishness aroused a bitter hatred between the class most exposed to become criminals and society itself; that it made laws, and courts, and police merely objects of disgust and terror; took away the whole sense of anything friendly, protective, and in the interest of the exposed classes from the aspect of organized society and government, and really tended to create the criminals it punished. It was the crime-creating power of the gallows and of the vindictive punishments of jails and prisons, the dangers involved for society, and the little deterring power which fear was discovered to have over brutal natures, that first drew attention to the fact that, if only the interests of society were to be considered, the *reformation* of the convict must be placed first and made the ground-idea in his penal treatment. It was not a mawkish concern for him, nor chiefly a feeling of moral obligation to reform him, that first opened the way to the new principle, but a broader view of what the safety of society itself required. The safety of society demanded that law and justice should not present to the people of any country, as their first impression, that of a power inimical to, or distinct from, or merely restrictive of, their freedom. It should wear distinctively the aspect of a friend, well-wisher, helper. It should appear as much the protector, ally, inspirer and encourager of their industry, order, virtue, and happiness, as the restrainer of their violence and vice. "For their good always," should be its characteristic expression. Thus laws, police, courts, prisons, punishments, legislators, parliaments, presidents, and kings become the recognized friends and helpers of the people—sources of hope and refuge in trouble.

In this new state of things the criminal classes, offending against only just and mild restraints and laws universally conceded to be necessary and for the good of all, rapidly lose the sympathy of those nearest to them in condition and prospects. Then criminals cease to be heroes and martyrs; society ceases to be regarded as a tyrant, and penal law and police to be objects of the hatred and evasion of all the lower half of the social system. The necessity of reforming the convict for the safety of society having been adopted as a first principle of prison discipline, it soon became plain that *he could not be reformed except he were reformed for his own sake also*. In short, it became apparent that his own consent must be obtained, if not to his imprisonment, at least to his reformation, and that this could only be effected by carrying out toward men *in prison* precisely the principles adopted in keeping men *out of prison*. If the friendliness of the law be the principle which makes

free men most observant of laws and least disposed to break them, and so tends to diminish the criminal class, by what other principle shall those already become criminals and convicts be cured of criminal propensities and returned to society with the least danger to its safety?

Accordingly, the reformation of the prisoner being conceded to be the best and most necessary service to the public safety, and his reformation being impossible without his own free agency and consent, the problem was, how to secure this consent, and, as a consequence, his co-operation.

Captain Maconochie cannot have been the first to see that hope is the only sufficient motive that can be applied to secure this object; but he certainly was the first to feel that absolute confidence in it which was necessary to make it the cardinal working principle of a method of prison discipline. He said to himself, What is the fundamental principle that in free society stimulates the human race to order, industry, virtue, and piety? It is hope; hope of living; hope of influence and power; hope of ease in old age; hope of the esteem and love of those about us; hope of forgiveness; hope of heaven.

What is the ordinary form which this hope takes in respect of all social interests? It is wages or money, that roughly represents the reward, in view of which hope labors. Take away the hope of this reward from industry, character, talents, ingenuity, patience, persistency, self-control, and self-denial, and you strike away the crutch from the lame, and they fall to the ground. Now, how can hope be made in prisons just as operative a principle within the narrow limits of its sphere, as it is in common free life? Why, only by adopting in spirit the very idea of wages. It does not so much matter what these wages are, how large, or in what form; for among people whose very condition of imprisonment reduces them to a low plane of expectation, a very small inducement, steadily applied and gradually increased, produces as much effect as only a very large one does upon people in free life. A crack admitting the least light to a dungeon would be as precious to a convict as the whole dawn is to a free man. A penny a day to one who can otherwise earn nothing would be as influential as a shilling to those who find free occupation.

Set hope at work, and keep it at work, upon ever so low a grade; if it is working steadily and habitually, you have got your principle of motion and your fact of motion, and you can now direct the vessel because she is under way, whereas you could do nothing to guide her while she stood still. Captain Maconochie's method of setting this principle universally at work at the least cost to the state and the greatest good to the convict, which is also the greatest good of the nation, was to establish for prisoners a system of *marks*, each of which represented a value, say of one penny. The convict, instead of being condemned to a certain and fixed number of years of imprisonment, was to be condemned to remain in prison until he had earned and had put to his credit a certain number of *marks*—say 1,000, 2,000, 5,000, or 10,000, according to his crime; but it is to be noted that only the surplus of marks, after certain material deductions, could go toward his liberation. The marks in Captain Maconochie's system had a money value; and the prisoner was first to pay, in that currency, for his food, clothing, bed, schooling, &c.; and it was the surplus earned by him that alone counted toward his release. This made the prison an image of real life, and brought into play, and enlisted on the side of reformation, all the motives which act on men in free society as stimulants to industry, order, and good morals. His system goes still further, and

allows the prisoner, if he so elect, to remain after he has become entitled to his freedom, and earn marks the same as before. In that case the surplus of marks, after the payment above specified, have a real money value, and are paid to him in *hard cash* whenever he takes his departure from the prison.

Every one of his prison duties—good conduct, industry in labor, docility at school—could each day earn for him, let us say, at its maximum, three marks for each department, or nine in all. It is easily seen how he might lengthen out his imprisonment by disobedience, sloth, and indocility; how shorten it by good conduct, industry, and aptness at learning; and what a steady pressure hope would exercise upon him under such a system. But this mark system had other advantages. The discipline of the prison was arranged, and this is especially the case as applied in the Crofton system, so as to graduate the severity of the convict's condition according to his marks. First, for the opportunity of tasting the bitterness of his crime and reflecting upon his past folly, he was solitarily confined and put on a very low diet, it might be, for six months at its maximum and four at its minimum, and there was always before him the hope of shortening this fearful solitude and low fare by quietude, by observance of all prison rules, by docility to the chaplain and keeper. Then came labor out of his cell, a great relief; but at first labor only of the most distasteful or arduous kind, with a slightly improved diet, in which second stage the prisoner by good conduct, industry, and docility, could shorten also his term in this lowest of the improved stages by a few weeks or months, and then be promoted into a better class, whose privileges were slightly raised, by less supervision, more variety, better food; and this again, if faithfully used, gave place to a still freer prison life, with greater advantages and more attractions. Thus hope was always beckoning the convict on, supplying him with inducements to do his best, and giving him, as nearly as his condition allowed, the motives that stimulate free citizens to toil, decency, and self-improvement.

What branches this main principle divided into and gave support to, we shall now consider.

The admission of the fundamental principle of hope into prison-life, on the score of its being the chief inspiration of free or ordinary life, instantly suggests that the fundamental fact in dealing with all human beings is, that they partake a common human nature, and, "*mutatis mutandis*," that the same essential motives, rules, laws, conditions under which they flourish, in one set of circumstances, are applicable to all. The essential conditions of growth, progress, reformation, are not changed by the most diverse circumstances. The wildest tribe of Indians falls under the laws of human nature as well as the most cultivated nations of the Saxon race; and progress, order, safety, industry, self-respect depend in both upon the same principles. It is not in essence, but simply in form, that the principles of action are changed. A prison is not so unlike the world outside its walls that the presence of men and women there do not make it more similar to free society in its wants and conditions of usefulness than its restraints and isolation make it different from such society. The world, under Divine Providence, is, in some sort, a prison; and the prison is, in some sort, a world. There is confinement, restraint, bondage in the free world; and there is freedom, opportunity, variety in the closest prison. You cannot free the most fortunate and unrestrained citizen from many restrictive rules and circumstances, and you cannot rob the chained convict of his freedom of thought and his excursions of

feeling and fancy. Indeed, freedom, in proportion to its political completeness, has its moral restrictions and its self-restraints intensified. Under the highest civilization, man, in becoming a law to himself, is attended by the most vigilant of police officers and the most implacable of task masters. There is no prison so impassible as that with which the obligations of duty surround the tender conscience, or the laws of reason the active intelligence, or the requirements of the affections the largest and most liberal heart. Those who fancy that free society, in proportion to its freedom, encourages or admits license, caprice, self-will, mistake the nature of the most operative restraints in the human soul. In the freest society, education, enlightenment, cultivated sensibility, conscientiousness, aspiration, piety, not only take the place of police supervision and criminal law, but they do their work a thousand times more rigidly and effectively.

But taking free society in its present average state, no mistake is wilder and more betraying than that which supposes its usual restraints and penalties to be light and inoperative. The restraints it imposes, the penalties it exacts, the burdens it lays on the backs of its children, are infinitely greater, more general, and more constant than statutory law can inflict. Burke says: "The laws reach but a very little way. Constitute government how you please, infinitely the greater part of it must depend on the exercise of the powers which are left at large, to the prudence and uprightness of ministers of state." And we may add all artificial restraints and contrivances, social or political, fall immeasurably short in their efficiency of those natural, self-enforcing penalties, restraints, and incitements which come from the very constitution of our nature and the world we live in. What motive could take the place of hunger, sympathy, paternal instinct, the love of power, the dread of pain, the fear of death, the hope of heaven? What device could fulfill the guardian-angelship of natural modesty and divine shame? What restrain like the natural sense of justice, the natural desire for the good opinion of others, and the natural dread of consequences? Our constitution, the laws of our physical, intellectual, moral, social nature are the tremendous barriers which our Maker has opposed to license and disobedience. We are in prison to them—a prison we may break, but never without penalty. They set a prison guard about us more vigilant and with more fatal weapons than can surround a jail full of murderers. The criminal laws of man, few, loose, inapt, bungling, uncertain, easily evaded, are directed mainly to the restraint of exceptionally low and vulgar natures; to the prevention of the evils that are least common, and which furnish no temptation to average humanity. But the laws of nature and the self-developing and self-acting laws of human society, are absolute in their strength and efficacy. They provoke little opposition and no sense of injustice. They are impartial and they are sleepless. But in the severity, constancy, and even penal character of those laws, we discover how it is God that governs the world.

If we would improve our laws, our schools, our homes, ourselves, we must follow God's method; leave natural principles undisturbed, fall back on the essential motive powers; keep hope always at work, and fling every member of society to the utmost extent possible, consistent with safety to the rest, upon an enlightened sense of his own interest, on the rewards that attend and follow obedience to justice, truth, and duty, and the stimulus that proceeds from that hope which perfectly equal laws, political and personal freedom, and an encouraging faith in God's goodness and in the benignity of religion, do so much to promote.

The most constant of the laws of Providence, in free society, is the *necessity of labor*; and it is the most benignant and most educational and disciplinary of all human necessities. Whatever theory of its origin we may adopt, we have no conception of any possible growth of humanity separated from the use and working of its faculties, and we have no experience of any adequate use of those faculties except under the steady spur of necessity. Labor, which alone regulates the restless love of liberty, the uncivilizing change of place, the native indolence of man in most climates, is provided for by the constant pressure of hunger—a want which is only greater than that of clothing—which is itself perhaps the more directly civilizing necessity, as it is less sensual than the want of food. All the other wants of society are modifications, developments, and refinements of these, shelter being only another sort of clothing, and architecture another form of shelter. The sense of property and its rights, and the public opinion which guards them better than law, are natural outgrowths of the value which labor puts upon its own conscious pains. But labor is animated not only by necessity, but by the discovery of its rewards, and the cumulative and ever-increasing preciousness of its results, as more of the powers of humanity and especially its higher faculties are mingled with it. There is no essential difference between the pains of thinking and the strain of the muscles; between work, whether considered as mental or physical. Both are induced and sustained by the same essential stimulus. As human nature refines its wants, the motive changes its form, but not its spirit, accordingly. The hunger for luxury may become as eager as that for food; the thirst for influence, fame, virtue, excellence, as imperative as that for shelter. Man's nature cannot be developed without its wants becoming ever more varied and more urgent, but the principle is always the same. What we want, we must labor to get; and it is only by labor that we can make even our gratifications satisfying. Thus protectors may furnish food, but what but labor in some form can furnish appetite? You may supply the indolent with books, but what but his own laborious self-cultivation can supply the skill to read, the taste to enjoy, the mental discipline to understand them? You may surround a prince with statues and pictures, but can anything short of the laborious cultivation of his knowledge and taste give him the power to enjoy them? Wealth, inherited, has few of the satisfactions of wealth created. Position, born-to, has none of the charms of position won. Plenty bestowed has none of the sweetness of plenty earned. It is impossible, in short, by any circumstances to overcome the necessity of developing, by labor, those feelings, tastes, habits, that condition of the man himself which is the other and more important factor in the felicitating result which is aimed at. This would be more universally conceded if labor were not so commonly regarded purely in its lower, more common, and more external forms.

But while man, in free society, has a providential necessity for labor, which can never be set aside or outwitted without penalties, he has also an instinct for freedom, a dread of labor, a desire to change its form, to escape its outward signs, and to get above its visible necessities. Those who lack this feeling become drudges or drones. Those who have it in excess impress the labor of others and become tyrants by force of will, genius, or strength. Make labor a double necessity, first of hunger and then of artificial compulsion, and you make serfs and slaves. Enact unjust laws, or perpetuate by law the injustice, greed, and ambition of earlier society—allow the land to pass into few hands—continue a feudal state of things—and you degrade the bulk of any na-

tion into mere day-laborers, whose aspirations and hopes are limited to their daily bread. But just in proportion as political institutions are equal and just, you offer to all men under their bland influence the highest balance of a general necessity for labor, with the greatest inducement to the cultivation and use of their best faculties, that their labor may be refined and rewarded in higher ways, according as their powers and aptitudes may allow. But let none think that Providence ceases to exact the strictest payments for its gifts in the shape of toil, self-control, and the highest and most painful self-culture, from those who seem to escape most completely from the ordinary necessities of humanity. Genius is a fearful taskmaster. Power is a prodigious worker. Elevation is often solitary confinement, and the vaster the sway and the mightier the forces controlled, the stiffer the hands that hold the reins and the more weary and worn the charioteer. In a word, labor as a necessity—now physical, now mental—permanently describes human condition in free society; and freedom in the discharge of this necessity is merely the change of the necessity from the belly to the will. The more free you can make this labor, by taking it off the back and putting it upon the brain—the more you can bring its compulsion out of the heart, conscience, taste, intellect, and the less out of the stomach—the more do you make it favorable to human dignity and aspiration. Political freedom, free trade, common-school education, religious bearing, immortal hopes, equal laws, protection of property and rights, all aid in, and are measured off by, this result. Men must work with hand, or head, or heart. Get their free consent to this work by making them feel its blessedness as a law of Providence, and not merely a blunt necessity of fortuitous circumstances, a misfortune of their lot; let them see that so they are built up and dignified, and so society is exalted, that the God who made them is their friend as well as their prison keeper and governor, and that all things in His providence and our nature work together for good, if we observe His statutes and laws written in that nature and our lot, and you achieve the highest possible results of social existence, as well as secure the largest returns of individual happiness and excellency.

It is these principles which the new science of prison discipline, based on Maconochie's method, is seeking to apply to the treatment and elevation of prisoners. Hope being the root of the principle, labor and freedom are its two chief branches. The prisoner must be kept at labor, because labor is the great burden and necessity of all free life, and its chief educating opportunity. Solitary confinement, deprivation of occupation, beyond a very limited period, in the way of punishment, at the outset of the convict's imprisonment, are found wholly lacking in any power to renovate and reform. They do afford an opportunity for reflection, and they humble and break down the prisoner's false pride and sense of power to defy the law. But the very feelings thus usefully started are paralyzed, if not put to a speedy use; and a dungeon or cell becomes, after a while, a place of sleep, apathy, idle thoughts, or prurient fancies. Besides, the prisoner who is fed at the public cost, usually quite as abundantly or more so than people at liberty in his own social class are fed by their labor, often feels that he is compelling society to support him, and successfully evading the law that, in the sweat of his brow, he shall earn his bread. Keep him for years in this idleness, and he goes out of jail utterly ruined as a laborer, and often speedily returns to prison, sometimes by an act purposely committed to secure that end. A life of full-fed idleness in prison is sweeter to degraded natures than a life of ill-paid and ill-fed labor out of it. As soon, therefore, as the

convict has passed through his short season of solitary confinement, he is put to hard labor, on poor diet; but, with the feeling that he is now earning his own bread, he returns in part to the ordinary wholesome state of free life. But his labor is soon made less bitter, if it is not made sweet, by the announcement that he can slightly improve his fare by diligence, co-operation, quiet behavior, and the careful observance of all prison rules. A few months of the least attractive form of labor, if the prisoner earns the privilege by good conduct, are rewarded by a choice of occupations. He is put to the trade for which he has an aptitude or preference. Now, again, his diet is bettered.

By degrees the social nature, which is so important a part of man, and so educating and invigorating, is allowed to take its part in his elevation. The prisoners are separated into small squads, and permitted to carry on their work together, to help each other, and finally even to live together in huts or cabins, always, of course, under necessary restrictions and supervision, but with a steady eye to imitating, as far as possible, the workings of free society, accustoming them to social influence and to membership one of another. As much room as is compatible with security and their safe-keeping is given to their free will. They are continually encouraged to work from inward motives, from a sense of benefit to themselves, from hope of reward, and from a consciousness that both their labor and their indulgences are regulated with an eye to their personal reformation and their preparation for future self-support in the ways of order and virtue.

But what has become of punishment under this hopeful system of reformation? Is not the sense of confinement, the necessary association with convicts, the brand of the public prison, isolation from the world, and the suspension of the freedom to go and come, and do and not do, which belong to the innocent, punishment enough? But that is not the true answer; the severity of punishment is in no degree to be measured by its external amount or its cruelty of form, but by the degree in which it is felt. If you kill sensibility you destroy the power of suffering. You may whip a prisoner till he ceases to feel the blows. You may extinguish the sense of freedom until the prison ceases to be an object of horror or offense. You may dull the conscience until no appeal starts a responsive pang. You may accustom man to hardship until hardship ceases to have any sense of trial connected with it. The true method of making punishment effective is to make the object of it sensitive to its stroke. You must not toughen either the outer cuticle or the true skin of the heart, if you expect your blow upon either to tell. A gentleman feels a slight imputation on his honor more than a ruffian does a stab. A breath of calumny afflicts an innocent and modest woman more than a public trial does a lewd sister. Even then, if punishment is to be made dreadful, it is only within the boundaries of two principles that it can keep its efficacy. You must not extinguish or lessen sensibility by the hardening process of frequent, persistent, and cruel penalties. To make a soldier familiar with the lash is to destroy its dread. To make a prisoner familiar with solitude, with hunger, with stolid neglect, with dull routine, is to destroy or annul their penal influence, their deterring power, their chastening or their moral influence.

All punishments the world can render
Serve only to provoke th' offender;
The will gains strength from treatment horrid,
As hides grow harder when they are curried.

—*Trumbull's McFingal.*

Punishment is not lessened in its power by external mildness, by careful graduation, by considerate and infrequent application. Even suffering, which it must be recollected is at last a personal feeling, is not morally diminished by any process which increases sensibility faster than it diminishes violence. The probability is that it is the best and most improving prisoners, those who have the most privileges and the nearest approach to free life, who feel their sufferings and their punishment most acutely. For they still have the love of liberty, the elements of self-respect, and the consciousness of power to be good citizens tugging at their heart-strings. They have the reproaches of conscience, the memory of an innocence they have lost, the longing for an opportunity to try their good resolutions, all intensified by the shame of their situation. Brutal, hardened, self-abandoned men, accustomed to daily severity, hopeless, and without interest in themselves or their future, are not great sufferers; they are fast becoming insensible stocks and stones.

It is a radical error, then, to assume that making more of the reformatory aim makes less of the penal. That is really *more* when put in the *second* place, than it could be if left in the first. Do you suppose that a prisoner of average sensibility feels most a blow, or a word of reproof and exhortation, of kindness and sympathy? Many whom stripes cannot touch are deeply moved to suffering by a sympathy new to their hearts, which opens the closed flood-gates of remorse.

The new processes of milder and more reformatory methods are not designed to make the prisoner dread the jail less or feel more comfortable there, nor do they have that effect. They are designed to bring the more sensitive parts of his nature under the influence of punishment, and to make that punishment elevating and reformatory, instead of being merely degrading and brutalizing. You may flog a boy until his hands are too tough to suffer, yet he has sensibility still left somewhere on his skin. You may apply severe punishments only in one way, and with so much routine and narrowness of application that they lose all responsiveness from the nature they aim to reach. The *more* of the man you can keep open and exposed, the more of thought, feeling, conscience, affection, hope, you bring under your penal application, the larger and more effective is your weapon; therefore, whatever free-will, whatever freedom of action, whatever education, whatever moral influence, whatever affection, whatever else tends to increase the area and sensibility of the criminal's humanity, offer you new chances of punishment with new chances of reformation.

It is with the convict under cruel, or brutal, or persistent penalties as it is with society under oppressive and intrusive or vindictive laws. To make shop-lifting a hanging offense does not tend to diminish crimes of violence. "As well be hung for a sheep as a lamb," says the thief; one crime is as bad as another. Thus moral distinctions are blurred, the wisdom and justice of society are arraigned, and the lower portion of the world becomes insensible to the moral considerations most potent over the beginnings of vice and crime. If you make vexatious and intrusive tariff laws, and affix unreasonable duties, you harden the mercantile conscience, and convert even the better class of women into petty smugglers. Few laws, mild laws, impartial laws make sensitive citizens, enlist the good will of the public, favor their own certain enforcement, and bring into play those private forces of personal self-control and conscientiousness which are the chief and final hope of order and justice.

Prisoners are men; criminals are men; jails are in and a part of the social system; and the identical principles, and as near an approach as

possible to the methods of ordinary life, are both more penal and more reformatory than any others. It is found that the rules of sick-rooms in private homes are the best rules for public hospitals; of course they cannot there be carried out in perfection, but they must be reached forward to with all pains. So the insane are now governed as nearly as possible by reason, and as much as possible like the sane. The old plan was to forget that insanity is a disease of sanity, just as the old medical practice forgot that bodily disease was the disturbance of forces which in equilibrium we call health, and that the laws of health, and not the laws of disease, are the great foundation of true therapeutics. Until crime is regarded as a disease of society, that must be cured on social principles, and in accordance with social laws; until criminals are considered as belonging to the human species, and still mainly to be governed and cured by universal human motives and human sensibilities, we shall not have reached the very key to the whole problem.

For the committee :

H. W. BELLOWS.

3. REPORT OF THE STANDING COMMITTEE ON PRISON DISCIPLINE.

Prison discipline, as a subject of inquiry by this committee, includes the exposed classes in society and the criminals. The former are the friendless poor, the uneducated, the immigrant population, and those who are born into such surroundings as drunkenness, license, fraud, &c., or who unfortunately inherit, in their constitutions, imbecility, vicious impulses, or nervous disease. The latter are those who, having committed crime, are either in prison or at large. The best information to be had warrants the estimate of 40,000 as the number of actually imprisoned criminals in the United States at a given time. There are no reliable data on which to found a statement of the percentage of criminals who evade commitment to prison. But there is no doubt that a large proportion do. If it were supposable that the objective causes of criminal acts, and the causes that tend to repress crime and contribute to the reformation of criminals, were about evenly balanced, we might hope that this proportion, whatever it be, comprised the criminals of the country, a fact sufficiently alarming, whether viewed in its financial relations or as a source of danger to life and property. But, doubtless, the influence of the criminals at large upon their progeny, upon their associates, and upon society in various ways, is in excess of the governmental and moral means for repression, and no general reformatory results are reached with those who are imprisoned; and since about one-third of these latter are annually released from prison, the prison population itself becomes a center of crime-production.

A numerical estimate of the classes especially exposed to commit crime can scarcely be made with sufficient accuracy to give it much value; and since this report proposes to treat chiefly of the criminals themselves, it will not be attempted. It is safe to affirm, however, that there is a migratory population, without accumulated means and with few social ties, who earn irregularly and spend prodigally; that there are others who are penniless and improvident, though having a fixed domicile; and that there is a large class who, from one cause or another, depend on public or private charity. There are others still, whose occupation and associations serve to develop the baser passions at the sacrifice of the benevolent affections and moral sentiments, though possessed of sufficient pecuniary resources. These several classes constitute, altogether, an uneducated mass of beings, with some virtues doubt-

less, but nevertheless specially exposed to temptations. So there are hundreds of thousands fresh from foreign countries, possessing but imperfect knowledge of our language, our laws, and our social customs, strangers in a strange land, the prey of political partisans and unprincipled sharpers, who are crowded into the cities or pushed out upon the frontiers of civilization, and wholly unaccustomed to the freedom which they enjoy here, many of whom are likely to infringe upon the rights of property and person, and to offend against the peace and order of society. And also, beyond question, there is a large class, possessing the unfortunate inheritance of deficient mental and moral faculties, with ungovernable animal instincts or diseased nervous conditions, rendering their proper behavior, in mixed society, a practical impossibility, without the restraints of the law.

We have, then, as the subject of our inquiries—1. Some 40,000 criminals actually in custody; 2. An unknown quantity of the same class abroad in the community; and, 3. An indefinitely large population peculiarly exposed to crimes.

Prison discipline, in the broad sense, has to do with the exposed classes by way of introducing and conducting special preventive agencies, and in this work we seem to be limited at present to investigation and recommendation, for the people are so jealous of any apparent infringement of individual rights that they are impatient of the restraints and obligations necessary to this end. But good progress has been made of late through the enactment of compulsory education and stringent liquor-laws in some States, and, though these laws are very imperfectly enforced, they show a degree of attention to prevention and an improved sentiment which are very encouraging.

The State of Michigan follows Massachusetts in the next practical measure, and promises to improve upon the Munson establishment in the last named State. There is now in progress of construction by Michigan, at Coldwater, a State public school, embodying the main features of both the family and the congregate ideas, as separately applied throughout the country in its reform schools or houses of refuge. The establishment will comprise ten cottages for families of thirty each, with suitable buildings for meals, for school, and for employment, the whole to be attractive in architecture and general arrangement; and it is designed by the projectors to institute the very best school facilities and far better social surroundings for the scholars than are generally provided for the wards of a State. In short, the design is to qualify the inmates for the higher occupations and social walks, and to see that they are duly introduced into them on leaving the school. The act creating this institution provides that "there shall be received as pupils in such school those children that are over four and under sixteen years of age, that are in suitable condition of body and mind to receive instruction, who are neglected and dependent, especially those who are now maintained in the county poor-houses, those who have been abandoned by their parents, or are orphans, or whose parents have been convicted of crime." Doubtless further legislation will be had this year, enlarging the scope of this school so as to embrace all the really neglected and dependent children of the State. It is hoped that the best expectations for this new institution may be more than realized, and that other States will establish similar ones. It is unnecessary to occupy space in this report in calling attention to the numerous and various private charities suggested, established, and sustained by the practical Christian sentiment of the times. Yet we may be indulged in offering our congratulations at the humanitarian and religious activities indi-

cated by these and other means to improve the classes of society under consideration. It is hoped also that the influence of this association may be applied to facilitate a similar tendency in the spirit of civil legislation. When the advocacy and support of the various schemes and measures presented to the Federal and State legislatures are conditioned upon their value to the more defenseless and deficient class of the population, instead of the more influential and better-endowed portions, the prosperity of the whole will be best promoted, and much be accomplished toward the more effectual prevention of crime.

The actual relation between criminals in confinement and the crime class in society, and the proper office of government toward each, are questions that should engage the attention of the association at once, for they must underlie all plans for practical reforms. It is coming to be understood that there is a marked difference between the exposed class and the criminal class—that an individual of vicious impulse who is restrained by his own will or saved from the overt act of crime by his favorable social surroundings is a better citizen than he is when the Rubicon of crime is passed. There is an added impulse given by the overt act, the hold of restraint is weakened, and, as a rule, the chances of moral reformation are greatly diminished. It is this knowledge that is producing the conviction in many thoughtful minds that criminals (and by criminals are meant all those who commit offenses justifying their public punishment) should remain under governmental guardianship so long as is required either for the protection of society or to aid the criminal in his efforts to reform by the moral force of his legal liabilities and relations.

The criminals abroad in society probably supply the prison population to a much larger extent than is generally supposed. Prisoners who are received for the first time at the State prisons for felonious crime, have in many cases been previously imprisoned in jails, municipal prisons, or houses of refuge, for lesser offenses. And the prisoners of the latter class are notoriously repeaters, having had in some cases the experience of imprisonment in the prisons of several States or cities.

It is a popular fallacy that virtuous citizens often suddenly fall into crime and are committed to prison. Such instances may possibly exist, but they form the exception and not the rule. When persons have fallen into crime, having come down from virtuous and respectable heights of character and social position, it has been by an easy descending grade of slight deflections at first, then moral delinquencies of the milder type, until, finally, and often from the accumulated pressure of inward impulse and outward distress, actual crime is committed. But they who have actually *fallen* are but a tithe of the criminal population. The mass are *born* into it, or are *trained* for it, with or without their own consent. The criminal class is an abnormal social growth.

After suitable measures to repress this growth, the first care should be for the discharged criminals. The pittance bestowed on their release from prison and the scanty wardrobe supplied even when accompanied with the "good advice" of the warden and the "God bless you" of the chaplain, are of little worth to the criminal, and much less to society, as a guarantee of his future right conduct; and, as a rule, no guarantee whatever is furnished by the fact of his imprisonment under the best known existing prison system in this country. So that society is in the plight (which would be ridiculous if it were not too sad) of temporarily restraining dangerous persons, then of still further degrading them by penitentiary treatment, and, finally, of turning them loose again, to ply their evil calling, without the least supervisory control.

Protection from discharged prisoners and the requisite aids for reformation must come from benevolent societies, relying upon the prisoner's voluntary acceptance of the proffered help and his permanent choice of an upright and virtuous life, or from governmental guardianship and control. Private benevolence can never meet the want, for it is in its nature fitful, is insufficient in its means, and cannot command the beneficiary class. As a rule, they who most need the restraints and helps to be derived from this source are the last to choose it; their choice is rather indolence, excesses, and such associations as belong thereto. For the few reformed prisoners, and for the imbecile of body or mind, these efforts are of great value; but for the headstrong, heedless, hardened crowd who, having been released from prisons, are now abroad in the community, some authoritative supervisory control must be had, and is, indeed, the best thing for both. This surely can be had, for, however jealously we may guard the individual rights of the humblest citizen who keeps himself within the limits of the law, when he becomes a criminal, or commits offenses requiring, in the judgment of competent courts, his personal restraint, then he cannot reasonably complain if restraint is continued to such an extent, and so long as may be necessary to protect society from his depredations, and to protect himself from himself. Public sentiment on this subject is somewhat divided. There are those who object to laws conferring governmental control of criminals after they are released from prison, on the ground that—(1) Such control cannot be accomplished. (2) That it would create a crime class, generally known to be such. (3) That the untrammelled free action of the mind is necessary to self-improvement and reformation; therefore this control would tend to defeat its own object. Others believe that the apparent difficulty of operating such laws may be overcome by the ingenious mechanism of the law, and by experience in administering it. They believe that the crime class is created already, and that the effect of the law will only be to define and reveal it, which possesses for society, certainly, as many advantages as disadvantages.

Unrestrained action, in opposition to or disregard of just obligation, is not liberty but license. The peace and welfare of society can only comport with absolute individual freedom, when the impulses are pure, the reason fairly developed, the moral sense rightly cultivated, and the whole properly balanced. Not one of us but lives under somewhat of restraint; none can safely give rein to all the impulses of his nature. The amount of restraint should, and in God's moral government actually does, depend upon the moral quality of the mind acted upon. Rightly considered, sin restricts our liberty; so untaught and rebellious citizens should be hemmed in by human laws, and allowed only a limited range for the exercise of free choice.

It would seem to be a self-evident proposition that the unreformed criminals in the community can gain nothing by the absence of restraints, but would gain much that would be of real, though unwelcome value to them, by such continued supervisory control as is here suggested. It is hardly necessary to add that proper governmental supervision of discharged criminals can be had only by continuing indefinitely somewhat of the control conferred by the courts at the time of conviction. Once restrained of liberty for violating the laws, governmental control should never be *fully* relinquished until the prisoner has at least the following qualifications for citizenship: (1) He should be able to read, write, and cipher, sufficiently at least to keep account of his receipts and expenditures, and the mind should be so molded as to make his judgment in common affairs reasonably true. (2) He should possess within himself

the experience and skill necessary to earn an honest living, or be taken in charge by others who are able and willing to provide for him, to which they should be pledged by a bond. (3) Satisfactory evidence should appear, not only that the prisoner has sufficient education and intelligence to care for himself, and possesses the ability to earn his living, or has friends to provide for him in respectability, but that there is a reasonable probability that he will use his faculties and resources aright; in other words, that there have been effected in his mind such changes, and these actually and practically tested, as will afford a guarantee of reasonably right choices in the presence of different motives.

Of course this involves changes in the prison system, but it involves much more than this. There are required training or testing establishments; establishments somewhat technical in their character, specially adapted to their peculiar work, in connection with which probationary periods of enlarged liberty should be allowed. They should embody the following principles, at least: (1) While legal control is retained, there must be such relaxation of present personal restraint that the prisoner is consciously free, under the play of such motives as ordinarily influence individuals in society. Of course, failure to choose and act right within his sphere would be evidence of unpreparedness for return to society. (2) The aim should be to fit each individual for the highest social condition possible for him, and to this end the school or reformatory must embrace instruction in employments, from the humblest mechanic art or agricultural pursuit, to the higher mechanical employments and the fine arts; this upon the principle that the weak and wayward most need the support of good social surroundings, which are most likely to be found among those engaged in the higher employments. (3) A high standard of honor should pervade these establishments, and constitute the disciplinary *régimé*. One who cannot distinguish what is honorable from what is dishonorable and mean, or who, thus distinguishing, has not self-control enough to restrain himself, should be deemed unfit for the school or reformatory, and, after due deliberation, should be banished to a lower grade of the series. Such a sense of honor involves moral integrity and a spirit of self-sacrifice, two qualities of character which, when dominant in the mind, are good guarantees of right citizenship. (4) The principle of religion must surely be implanted here—not any denominational religious *system*, but sincere recognition and reverent love and worship of Almighty God.

Protection for society from discharged prisoners through such establishments as we have described, involves, of course, the preparation of prisoners for such a graduation while they are confined in the other prisons of the state. In other words, a reformed prison system, substantially as described in the Declaration of Principles of the National Prison Congress of 1870 and of the International Congress of 1872; a system in which the object of vindictive punishment is left out; a system in which indulgence for its own sake is left out; in short, a system, which neither relies for the suppression of crimes upon the repression of criminals, nor mainly upon their persuasion, but rather upon their restraint, cultivation, and cure.

That the present wretched apology for a prison system in our country may, through proper effort, be supplanted by a truer ideal, which shall accomplish these results, the committee have no doubt. That, in the progress of civilization, this *will be done*, the committee fervently hope.

It is believed that this association ought at once to ascertain in which of the several States the true ideal of a prison system may best be planted, and that our influence should be brought to bear to accom-

plish it. An examination of the laws and institutions of such State should be had, and the necessary changes therein carefully noted; indeed the whole work of the proposed experiment, and the successive steps leading to it, should be by us mapped out in detail, so that it would only remain for the State authorities to adopt or reject. A carefully selected committee of citizens of such State warmly enlisted in carrying it out, and the expected co-operation of the State authorities, if realized, would be likely to secure the trial, when we could present to other States, and the world, a practical demonstration of the wisdom of the plans and principles we hold, but unfortunately now content ourselves with only proclaiming over and over again in our various public documents.

For the committee:

Z. R. BROCKWAY.

4. REPORT OF THE STANDING COMMITTEE ON DISCHARGED PRISONERS.

The committee on discharged prisoners can add but little to the information contained in the report made to the association by the committee of last year, which presented, as far as it was known, what organized effort had been made in the various States of our Union to improve the condition of this class of persons.

It is sad to look over our vast country and see how utterly inadequate are the means put forth for their relief. We are exhorted by the Apostle, "as we have opportunity, to do good unto all men," (Gal. 6:10;) and it is one of the obvious duties of society, for its own sake and for that of its liberated convicts, to render permanent any beneficial influences resulting from the discipline of the prison. But on the restoration to liberty of many thousands of convicts annually, little care is taken, save in a few favored localities, to give them the hand of Christian sympathy, to encourage them in good resolutions, and to "set them in a plain path because of their enemies." (Ps. 27:11.)

It is very easy to make general abstract declarations of duty or resolutions of action in the premises. A widely different matter is it to decide wisely what ought to be done in the multiform individual cases as they arise, and *to do it*. Whether his term of imprisonment has produced penitence and resolutions for virtuous living, or whether he is impenitent and prepared with whetted appetite to pursue a course of crime, the time of the release for each convict comes. Perhaps, a harsh keeper* who has fed and worked, restrained and punished him, who has looked upon him as one who must be resolutely "kept down," a dangerous man, incapable of improvement, now feels that in parting some "good advice" from himself, as the representative of the State, is called for, and he counsels him to industry, sobriety, and honesty. But such counsel from such a source gives him no strength for the stern battle at once upon him. The grave questions: Where shall he go? What shall he do? With whom shall he associate? It may be the sadder inquiry, who will associate with *him*? press for immediate answer. He feels that he is degraded and disgraced. Shall he seek the friends whom he has grieved, perhaps wronged, or shall he go among strangers?

Does any one think that society has no interest in the solution of these questions? Is it beneath the notice of the conservators of the public welfare what influences shall determine the course of a man, despised indeed, but yet possessed of powers which at this critical moment of his

* Many keepers, it must be said, are not harsh, but gentle and gentlemanly, remembering the golden rule in dealing with those under their care.

life may be directed either to bless or to curse the community? Temptations to robbery, arson, murder run through his mind, but a few words prompted by a kind and loving heart, the offering of a prospect of honorable and useful employment, with a vista of better days temporally and spiritually, may be the means of turning his feet into the paths of virtue. By the rescue of such an one from the toils and penalties of crime and his addition to the ranks of honest industry, society gains by a relief from his depredations, and also from the apprehension of them, as well as by the actual benefit of his labors.

Relief to discharged prisoners, however, requires wise consideration in the individual cases as they occur. It can, perhaps, hardly be accomplished by special homes or manufactories, as has sometimes been proposed. The most hopeful plan appears to be the appointment for each considerable prison of an officer whose duty it should be to make himself acquainted with the prisoners, especially with those whose confinement is near to termination, to win their confidence by kindly ministrations and undissembled interest in their affairs, to learn by delicate inquiry their history, character, capabilities, and desires, and then by outside correspondence to secure, if possible, for each departing convict a comfortable home with employment suited to his needs, to which he can go at once, without being subjected to the temptations of contaminating associates. He should be, if necessary, accompanied to his new domicile.

A mere mercenary laborer is not wanted here. The agent may be a plain man, but he should be possessed of some rare gifts and graces. He must be warm-hearted, generous, and, where it is deserved, confiding, of quick perception of character, of undoubted truthfulness and integrity, and of sound practical common sense, making his counsels valued because they are valuable. He should feel an earnest interest in the spiritual and temporal welfare of his wards, and manifest it by loving watchfulness over their subsequent career, holding them in the bonds of respectful attachment.

Some of the prisoners' aid societies have, happily for their beneficiaries, found such men. Provision for the appointment of one or more agents should be made by law in every State where it cannot be effected by voluntary associations, which, with needful aid from the State, are greatly preferable. To be without some such arrangement seems a folly and a crime, for if society sins by its neglect of duty, it must suffer the penalty. Wardens have reported of some discharged prisoners that they have loitered about the prison for hours, utterly at a loss to decide where to go. Some have been decoyed into vile rum-holes and stripped of the few dollars allowed them on their discharge. Others have been liberated at their own request before the morning light, that they might escape the seductions of old associates whom they knew would be lying in wait for them during the day. Some, refused employment or discharged as soon as their late home was known, or stung by the averted looks and cutting words of old acquaintance, have become utterly disheartened, and, on temptation, have broken sincere resolutions of correct life. The value of the counsel and assistance of a wise and sympathizing agent in such cases need not be shown. This officer should have an office in the prison or contiguous to it, where, by public announcement, he could receive applications for laborers.

It may appear a solecism to say that the care of discharged prisoners should commence on the day of their incarceration, but as the wished-for end is their effectual separation from the criminal classes, it is obvi-

ous that legislative enactments and the discipline of the prison should be such as to promote and, so far as possible, to *secure* that object. The system of marks, and grades, and tests; of religious, moral, and literary instruction combined with labor; of conditionally promised commutation and pecuniary reward—these encourage a prisoner to do right, stimulate him to overcome his evil propensities, and strengthen him in habitual good conduct. Many will thus become worthy of the recommendation of the agent, and will justify it on their complete liberation. Of those who evince no signs of reformation, and who will only return to society to prey upon it, it may not be out of place to express the conviction that they ought not to enter the list of *discharged* prisoners. The victim of some terrible accident is not sent to the hospital for a prescribed time, but until curative treatment restores his bruised body or shattered limbs. An insane patient is retained in the asylum, not for so many weeks, but till returning reason fits him for self-control. In the case of a desperate criminal, a special time-sentence seems equally inappropriate, and should be changed to one conditioned upon his reformation.

For the committee:

SAMUEL ALLINSON.

III.—PAPERS COMMUNICATED.

1. THE CRIMINAL.

By Dr. Prosper Despine, France.

[Translation.]

The importance of this subject appears from the single fact, eminently rational, that a knowledge of the criminal is an essential guide to a right treatment of him; a knowledge of him, not in his acts, which are but too well known, but in his spirit, in the psychical condition which impels him to commit crime, and to renew the monstrous act as often as circumstances permit.

There must be something abnormal in the disposition of criminals, when they yield, with the utmost facility, to desires which would excite the strongest repugnance and horror in a truly moral man. Does not this abnormal state reveal itself in the clearest manner when, contrary to what poets and moralists have represented, we see the wretch who has committed crime exhibiting no symptoms of remorse, but rather a disposition to repeat the same criminal act? Such is the thought which has prompted me to study, with the greatest care, the psychical condition of criminals, or, if you please, the psychology of criminality, in order to fill a hiatus which, hitherto, has existed in science.

I propose, in this paper, to set forth some of the views suggested by my psychological study of criminals. These views, exhibited at length in a work which I have recently published, will be traced here only in outline. But I hope that, however briefly presented, they may engage others to enter the path which I have opened, and to pursue it with perseverance; a path which I consider the most rational and the most likely to lead to a right treatment of those perverted beings who disturb society so profoundly and with such regularity that both the number and the species of their crimes may be foreseen and predicted with almost unerr-

ing precision. Now, just as in order to the rational treatment of a sick man, it is necessary to study the organic disease with which he has been attacked; in the same manner is it essential to know the abnormal psychical condition, or, to speak better, the moral disease which produced the crime; a condition without which, from the study I have made of criminals, great crimes are never committed in cold blood; for I have found, without exception, this abnormal psychical condition in all great criminals.

I have spoken of *moral disease*. This demands a clear and exact definition. Let it not be supposed that I look upon the criminal as diseased in such a sense that, like the insane, he stands in need of medical treatment. If, in certain cases, crime is committed under the influence of a pathological cerebral condition, little apparent to the magistrate, but in general recognized by the physician versed in medical jurisprudence, the ordinary criminal, the criminal who peoples the prisons, is almost always healthy in body. His mental state does not grow worse, like that of the insane patient, in the sense of the gradual destruction of all his faculties. Let us, then, settle this preliminary point, viz, that the criminal is not a patient, and that, in this respect, he must not be likened to the insane.

But, although sound in body, the criminal none the less manifests psychical anomalies of a very grave character. But we must not seek these anomalies in the intellectual faculties, properly so called; in the perception, in the memory, and in the faculty of associating ideas, of reasoning, that is to say, in the reflective powers. Although many criminals are as scantily endowed with intellectual as with moral faculties, it is not the lack of intelligence which is the distinctive character of these dangerous beings; for there are among them persons of great intelligence, capable of forming ingenious combinations, which are the product only of strong reflective faculties. The distinctive anomalies of criminals are found only in the moral faculties, in the instincts of the soul, out of which spring its desires and proclivities, and which constitute our principles of action: for it is these which impel us to act in one direction or in another.

In studying criminals, the first thing which strikes us, and which is obvious to all, is the *perversity*, the criminal thoughts and desires, inspired by the evil inclinations and vices inherent in all mankind, but more emphasized in criminals than in other men. It is the violent passions—hatred, revenge, jealousy, envy; it is also other passions which, without being violent, are no less tenacious in criminals, such as cupidity, the love of pleasure, profound repugnance to a regular life and to labor, and an intense indolence. These two last-named vices impel criminals to seek the means of satisfying the material wants of life and the enjoyments which they crave, not in honest toil, but in readier ways, which are immoral and hateful—in theft, arson, and murder. These qualities in criminals are manifest to the eyes of all. But do these malign passions, these immoral propensities and desires, constitute a really abnormal psychical state? By no means; and the proof is, that these evil tendencies, these wicked passions, these perverse and criminal desires, make themselves felt in the soul of the most upright man, without his ceasing to conduct himself in a virtuous manner, for the reason that he wages a successful warfare against them. There is no need to enlarge upon this point, which is so well known, that persons engaged in the study of the criminal, seeing in him only perversity, vicious inclinations, immoral desires, have considered him, in a moral point of view,

as normally constituted. His moral irregularity, then, is to be looked for somewhere else.

To understand in what this irregularity consists, let us examine what passes in the man recognized as normal in his moral constitution, when he finds himself in presence of a perverse thought, an immoral desire. Every one sees it in a moment. The conscience, that is to say, the right instincts of the soul, the moral faculties, three words which mean the same thing; the conscience, I say, is roused; the moral sentiments, opposed to the vicious instincts, are shocked by these ideas and desires, and, excited by the wound thus inflicted upon them, they react more or less vigorously, according to the degree of power they have in each individual. From this, a moral conflict springs up in the soul between the good and the evil sentiments. In this moral conflict appear, according to the more or less perfect moral nature of the man normally constituted, three orders of sentiments: 1. The good sentiments, which are developed and exert their force on the selfish side—that is to say, the moral sentiments which prompt to virtue and withhold from vice in a well-considered personal interest, but with no other view than some present or future advantage; such for example as the fear of punishment, of public scorn, of the loss of liberty, the dread of being deprived of the enjoyment of one's possessions, of being separated from his family, of leading a wretched life, a life full of privations, &c. 2. The generous sentiments, which lead us to act charitably toward our fellows, under the promptings of a kind heart, and with a view to the contentment of our generous inclinations. 3. The moral sense, the sentiment of right and wrong, accompanied by a feeling of *obligation* to do what is right, not in view of any satisfaction or advantage to be hoped from it, but because it is right; and to abstain from what is wrong, not on account of any suffering to be feared as a consequence, but because it is felt to be wrong. This unselfish and disinterested sentiment is the highest expression of the conscience, and its motive power of action, instead of being some personal interest or satisfaction, is *duty*. It is this lofty moral faculty which makes the man who is so happy as to possess it feel that he must repel a vicious or criminal act, however great the advantage to be gained by it, and however painful the course to be taken. It is this which drew from Kant, the great German philosopher and moralist, the exclamation, profoundly true: "Duty! wonderful idea, which acts neither by insinuation, nor by flattery, nor by menace, but simply by sustaining in the soul thy naked law, thus compelling respect for thyself, if not always securing obedience to thy commands."

Such are the three orders of sentiments, of moral instincts, with which nature has endowed us to combat the perverse instincts which she has also placed in our hearts, thus putting the antidote at the side of the poison.

Let us now glance at mankind as a whole. By the side of men normally constituted, although imperfect because they are men; what do we see? Anomalies, monstrosities. In a physical point of view, by the side of men well-formed, of robust health, of beautiful and noble forms, we find beings sickly, weak, ill-shaped, puny. Viewing men intellectually, what do we see? The same differences. By the side of men of genius, who create sciences, who produce those marvels of the imagination which, in literature and the arts, excite our enthusiasm, we find vulgar intelligences, insensible to the creations of genius and the splendors of nature, incapable of lifting themselves above the direction of their business and the material wants of life. Descending in the

scale, we meet, at last, with the weak-minded, the imbecile, the idiotic. These natural imperfections, these anomalies, these infirmities, these monstrosities, which we see in the physical and intellectual world, exist also in the moral, as marked, as numerous, and as varied.

It is to the reality and the nature of these moral anomalies that I desire to call the attention of this congress, for these anomalies, the saddest, perhaps, of those which affect humanity, are completely ignored, or rather their importance has not been perceived. Just because the man is in health, because he has command of his ideas, because he reasons, because he is *intellectually* intelligent, it has been thought that he must be also *morally* intelligent; that his moral faculties are in a healthy state; that his conscience is capable of feeling and weighing right and wrong, and that he possesses the ability to repress his evil desires without having ever dreamed of studying his moral nature, the state of his conscience; without having once thought of inquiring whether he is really endowed with moral instincts, with the moral faculties directly antagonistic to the depraved instincts.

The infirmities, the moral anomalies, to which your attention has been called, what are they? In what part of the man are they to be sought? Is it in the depraved instincts, in the immoral proclivities, in the criminal desires, even? Not at all; for, as I have already observed, the perverse sentiments, and the depraved ideas and desires which they inspire, are as much inherent in humanity as the virtuous sentiments and their moral inspirations. The presence of perverted sentiments does not, then, of itself constitute an anomaly. Whenever the antidote is found in the heart beside the poison, the moral state of that man is regular. But suppose the antidote represented by the moral sentiments is either too weak or wholly wanting. In that case the anomaly exists incontestably, the moral equilibrium is destroyed, for the virtuous instincts of the soul, and the moral thoughts inspired by them, can alone serve as a counterpoise to the power of evil passions, of perversity. It is this psychic anomaly, this feebleness, this absence of conscience with which criminals are stricken; and it is this alone which makes the criminal; it is this which makes it possible for a man to commit acts that wound profoundly the moral sense. The intellectual faculties are incapable, by themselves, of serving as a counterpoise to depravity; they take part in the combat against it only when they are directed in their activity by the moral faculties. It is a psychological principle which I have demonstrated in the work to which reference was made above, and which shows the supreme importance of the part played by these latter faculties in the battle against crime.

The psychic anomalies now under consideration, the absence of the moral faculties which, connected as it is with the presence of the immoral proclivities, makes criminals, are often hereditary, as are all the other vices which inhere in human nature. How often do descendants inherit from their ancestors the moral anomalies out of which crime, for the most part, springs! Not the slightest doubt can rest upon this point in presence of the numerous examples cited by Dr. Bruce Thompson, physician to the prison of Perth, in the *Edinburgh Evening Courant* of the 26th November, 1869. The organic condition connected with these grave moral anomalies, without being a real disease, since it co-exists with a healthy state of the body, has, nevertheless, a relationship more or less remote, but indubitable, with the pathological conditions of the brain, which produce the different varieties of insanity. The cases in which the children of the insane become ordinary criminals are

too numerous not to attribute the origin of this fact to an hereditary organic influence.

The extreme feebleness, and still more the absence, of the moral instincts, whether due to the fact that their precious germs, congenitally too weak to exhibit themselves spontaneously, have not been developed by a right moral education, or to the fact that the germs of these faculties are altogether wanting, constitute the saddest of the monstrosities to which the human race is subject. This monstrosity may receive various designations; I have given it, indiscriminately, the name of moral idiocy, moral insensibility, lack of conscience, different terms which give an exact idea of its nature. It differs infinitely in its forms, according as the virtuous sentiments are weak or deficient, and in its intensity, according to the degree of weakness found in these sentiments, a weakness which may reach to an absolute nullity. The sentiments whose feebleness or absence makes the moral idiot may be divided into three classes: 1, the moral sense; 2, the generous sentiments—pity, benevolence, charity, respect; 3, the sentiments of prudence, foresight, fear, and a well-considered personal interest. Let us take a rapid survey of the several kinds of moral idiocy caused by the absence of these various moral sentiments.

1. The absence of the moral sense in criminals may be readily made apparent. The conscience of the man who is so happy as to possess it, is wounded by his depraved thoughts, desires, and acts. It is, therefore, evident that he who experiences no moral repulsion in the presence of his criminal desires, and who, after having satisfied these desires, has no feeling of remorse, is really without a moral sense. This absence of moral recoil from criminal desires and of remorse after the commission of crime is a fact of observation of which I cannot now stay to give the proofs; but they have already been given by many observers.

2. The generous sentiments are wanting in criminals equally with the moral sense. Nature has endowed most men with sentiments of pity, of benevolence, and of charity toward other men. But great criminals are an exception to this rule. Without pity for the victims whom they rob or assassinate, the commencement of the criminal act awakens no kindly sentiment within them; nor does it recall them to moral reason, or arrest them in the execution. They destroy everything which forms an obstacle to their rapacity, and they do not cease to strike till their victim is without life. They never bemoan him; they even insult his corpse, cast ridicule upon it, and eat and drink tranquilly beside it. They have no sense of the value of human life. They murder for the veriest trifles, for a few pieces of money, for a momentary gratification; and not a thought is given to the sorrow they will cause to the family of their victim. If they commit the crime under some violent passion, they boast of the act; they glory in it; and they declare themselves ready to repeat what they have done. If their victim has escaped their rage, they loudly proclaim their regret, and express their determination to be more adroit next time. The reports of the court of assizes are filled with evidences of the cynicism with which criminals make these declarations. Insensible to the evil which they commit, regardless of the sad fate of their victims and of their families, they are equally indifferent to the punishments to which their accomplices may be subjected. It is truly marvelous to observe the facility with which criminals, who have been arrested, denounce their accomplices who are still at liberty, and how willingly they aid in their arrest. They do this either with the selfish aim of transferring to their accomplices the responsibility of the acts whose pressure they feel and of being less

severely treated, or with the wicked purpose of involving them in punishment, and of not suffering alone the chastisement with which they are menaced. The bond which unites these wretched beings is interest alone, and not affection. Thus, the moment this selfish bond is broken, they treat each other as enemies.

3. The sentiments which stand connected with a well-considered self-interest are those which are most frequently wanting in these exceptional beings, so abnormally constituted as regards the natural instincts of the soul. The lack of prudence is most conspicuous in individuals destitute of the moral sense, and in whom the selfish fear of punishment is stifled by some violent passion, such as hatred, vengeance, jealousy, and sometimes even avarice. In that case, we see these madmen threaten, publicly or privately, the person who is the object of their passion with the fate to which they have doomed him. These reiterated menaces indicate with certainty a crime on the point of commission, which it would be easy to prevent. There are criminals so devoid of the sentiment of prudence, that they talk coolly of appropriating what belongs to others by brushing aside all the obstacles which they encounter, so that, when the crime has been committed, the author is instantly recognized.

Improvvidence is strongly characteristic of the greater part of criminals. It is owing to this singular trait, which belongs, more or less, to the whole class, that they are entirely absorbed by the desire which possesses them at the moment. One would say that they do not so much as cast a thought toward the future, which, for them, is as though it would never be. The consequences of the crimes which they meditate make no impression upon them; and if they think at all of punishment, it seems to them that they will never be overtaken by it. Their mind is intent solely on satisfying present desires, in regard to which their conscience has no reproaches. In this manner, nearly all pursue the end they have in view, scarcely thinking of punishment, rushing fearlessly after some material good, often of infinitesimal proportions—after miserable pittance of money, madly squandered in a few days, even in a few hours. This extreme improvidence and this absence of fear give to criminals an audacity and an effrontery truly surprising. Without moral curb, and scarcely held in check by the well-considered self-interest which fear inspires, how should they not be daring, audacious? But this blind audacity is not born of true courage, which foresees danger, which fears it even, and which confronts it under the sole impulse of duty. This stolid audacity is the result of several species of moral insensibility, by which the criminal is characterized.

The man who can sell, at so cheap a rate, everything which a rational regard to his own interest would prompt him to desire, must necessarily be but feebly endowed with the sentiments which that interest inspires, and especially with fear. For trifling and transitory advantages, he exposes himself to the hardest chastisements, to the loss of personal liberty in places of detention, where he will be treated with severity; he exposes himself to be separated from his family, to be scorned, to die a violent and ignominious death, which wounds to the last degree the dignity of man. In a word, he prefers a vagrant and precarious existence to a life tranquil and regular.

In presence of these various sorts of moral insensibility, which are found in different degrees in all criminals, can there remain a doubt that these wretched beings are the subjects of a grave moral anomaly? Can there be a doubt of it, when this absence or deficiency of the moral faculties shows itself so palpably in its effects—first in the absence of all reprobation of the criminal thought, and then in the utter absence

of remorse after the criminal act? If I were not restricted to the narrow limits of a lecture, it would be easy to prove that the absence of these higher faculties causes a rude shock to reason and to moral liberty; but I will confine myself strictly to the question in hand.

The understanding, however great it may be, does not prevent or diminish the shock caused to the reason and the moral liberty of the criminal by his moral insensibility; it does not hold this man back from crime. Far from it. The understanding, when guided exclusively by perverted moral instincts, becomes, on the contrary, a power all the more dangerous in proportion as it is developed. Intent solely on the satisfaction of these instincts, it devises criminal projects and seeks the means of carrying them into effect; it produces, above all, malefactors fertile in criminal inventions, able chiefs of criminal gangs. In men depraved and morally insensible, the understanding is, therefore, a dangerous power.

Mere intellectual knowledge has very little influence in holding back these morally insensible natures from the perpetration of the crimes to which they are urged by their evil instincts; of which let the following fact serve as proof. Criminals know that what they do is forbidden by the laws, and that they are menaced by punishments; they know, generally, even the kind of penalties to which they expose themselves by such or such a crime; for professional criminals are well acquainted with the articles of the penal code which concern themselves. But does this knowledge hinder their attempts against society? Not in the least; society is none the less assailed by them. Laws and punishments are alike powerless, when the moral idiocy of these criminally-inclined beings extends to the imbecility or absence of the sentiment of fear; a thing by no means rare. This fact has long been well known, for it is an old experience: "Laws without good morals profit nothing." Laws, without moral sentiments and the good manners to which they give birth, are powerless and vain. The utter inefficacy of mere head knowledge, of intellectual power, before the depraved instincts of men devoid of moral sentiments, has not escaped the sagacity of the honorable president of the American Prison Association, Mr. Horatio Seymour, who expressed it in the following terms, at a public meeting held in New York, January 26, 1872: "Crime grows in skill with every advance of the arts and sciences. Knowledge is power, but it is not virtue. It is as ready to serve evil as good." At a time when almost everywhere, and especially in France, intellectual culture is proclaimed as the principal barrier against crime; at a time when little importance is attached to moral culture by means of education, the true means nevertheless of preventing this odious act, I am happy to be able to cite, in support of my opinion, a respectable name, and one having a higher authority than mine.

I have spoken only of criminals who commit crime in cold blood. I desire to add a few words concerning criminals who commit such acts under the influence of violent passions, such as hatred, revenge, jealousy, anger. In most of these, we find a moral insensibility as great as in cold-blooded criminals; an insensibility proved by the absence of remorse after the crime. Still, a small number of these persons may possess the moral sentiments to a sufficient degree. Suddenly overborne by some violent passion, which instantly stifles and paralyzes the nobler sentiments, they find themselves for the time morally insensible, and they commit the crime at a moment when all they feel and think pushes them on to it, and when none of their virtuous sentiments has sufficient force to combat the criminal desire. But when once the passion is sat-

isfied, it loses its power, and no longer holds complete possession of the soul. Then the moral sentiments, momentarily stifled, resume their activity, and, shocked by the depraved act, they produce a feeling of remorse and at the same time of regret that an act has been done contrary to their own interest; a remorse and regret all the more vivid, because the sentiments which had felt the shock, and which now cause these pangs of repentance, are stronger and more powerful than the passions which had obtained a temporary victory. In some cases, the moral suffering is so violent that it plunges the individual into despair, and impels him to suicide. I can only make a passing reference to these rare cases of genuine remorse after the commission of crime. We never meet with this sentiment in the criminal who has acted in cold blood, and only in a few rare cases do we meet it in one who has committed the crime under the influence of a violent passion. With these latter, amendment is prompt and easy, and relapses do not occur. This fact, which is altogether natural, did not escape Mittermaier. Persons employed in prisons, he says, have remarked that those imprisoned for crimes committed under the influence of violent passions—accidental crimes—sometimes show signs of repentance; that they are more submissive; and that they exhibit a conduct more regular than criminals who have acted in cold blood, and of whom a great number are criminals by profession.

This rapid and very incomplete survey which I have made of the psychical state of criminals, will, I think, be sufficient to convince the members of this congress that account should be taken of it in the treatment to which they are subjected, the study of which treatment is the object for which the congress is convened.

As the criminal offers a serious danger to society, society must defend itself against him; this is an incontestable right. But against whom has society to exercise that right? Is it against a man who has in his conscience, like other men, the necessary means to combat and conquer his immoral desires? According to the very brief description I have given of the abnormal moral state of which all criminals are more or less the subjects, we cannot fail to see that the moral faculties, which are pre-eminently the antagonists of the vicious sentiments, are wanting to them in different degrees. If these men, the subjects of a real moral idiocy, are dangerous, they are also deserving of our pity. To shield ourselves from the danger with which they menace us, we are under a necessity of separating them from society. This separation, with the hard conditions necessarily involved in it, constitutes in itself a punishment. I need not here concern myself with the kind of imprisonment which it is most expedient to adopt in regard to them; that does not belong to the subject which I proposed to consider. Still, I will express, in two words, my thought on this point: I regard all modes of imprisonment as evil and dangerous, as well to society as to the criminal, if their only aim is punishment pure and simple. I think, also, that all modes, provided only that mode is chosen which is best suited to the special character of each criminal, may be good, if they have in view the true interest of society, which is entirely based on the moral regeneration of the criminal, and if also the most effectual means are taken to accomplish that regeneration. The treatment which aims only to punish for the sake of punishing is dangerous both to society and the criminal; it never improves the criminal, and often makes him worse; it produces from 40 to 45 per cent. of recidivists. Let me cite here, as regards the existing prison system in France, some words of a French magistrate, which attest its total want of success. "In vain," says M.

Bonneville de Marsangy, "have our successive governments, in their anxiety for improvement, sent to Switzerland, to Belgium, to Holland, to Spain, to the United States even, citizens of the highest distinction, for the purpose of collecting information on all the experiments which have been tried; in vain have they sought the opinion of the members of the magistracy and of the high functionaries of the administration; in vain have they appealed to the special knowledge of the directors, chaplains, and inspectors of prisons; in vain have the legislative chambers elaborated the bills of 1840, 1844, and 1846; in vain has the Academy of Moral and Political Sciences undertaken the study of this delicate question: we are compelled to confess that, at the very moment in which I speak, all these imposing and multiplied labors and efforts have, so far, wrought no practical result, and the innumerable deliberations had on the penitentiary question, instead of eliciting light, certainty, agreement on certain well-understood points, seem to have produced absolutely nothing but confusion and mistrust, a sort of final impuissance, terminating in the *statu quo*; we are always there." This avowal was made in 1867, in an article published in the *Contemporaneous Review*. And is not this very congress a fresh proof that all is still unsettled in the penitentiary question? If such is the fact, we may rest assured that it is because we have taken a wrong road; it is because, hitherto, having taken as our guides on this question only fear and vengeance, and not scientific *data*, we have ever had in view punishment alone; it is because, never having studied the moral state which leads a man to crime, we have ignored this abnormal condition altogether, and we have not been able to perceive that, in order to arrive at a favorable result, we must aim to bring down to the lowest possible point this anomaly, which is so fruitful a source of crime. I have shown that the criminal is a being apart, that he is different, in a moral point of view, from other men. If this is so, would not the best way to prevent crime and protect society be to cause this difference to cease, if not wholly, since that is impossible, at least approximately, enough to render the criminal a safe member of society. The legislation which takes this point of departure will attain, we may be well assured, a degree of perfection which has no existence at the present moment; for, as Beccaria has said, "All legislation which stops with the punishment of crime, and does not aim to effectually prevent it, is imperfect." Now, to improve the prisoner, to develop in him the germs of whatever good sentiments he may possess, were they but the sentiments of material interest if he has no others, sentiments with which, nevertheless, he will be able to fight his depraved appetites; to give him the habit and the love of labor, by which he will be able to live honestly; and to arrive at these results by humane processes, with a view to teach him by example to act with humanity himself, instead of treating him as we would not treat dumb beasts—is not this the true means of preventing crime?

Reformatory treatment, applied to individuals abnormally organized in a moral point of view, is not a utopia born of my imagination. M. Demetz is the first who practised this treatment in France, which he has done with rare perfection in the juvenile penitentiary of Mettray. While these juvenile delinquents, when thrown into prison pell-mell with adult criminals, showed seventy-five recidivists in every hundred, they show only four per cent. under the strict but paternal direction of M. Demetz. No doubt this system, applied to adults, would require some modifications; but the base would be the same. The reformatory system has been also applied to adults, and, although its application has been but imperfectly applied in their case, it has, nevertheless, yielded

very remarkable results. In my work on criminals I have cited, among other results, those obtained by the director of the penitentiary of Albertville, Savoy, during an administration full of mingled firmness and gentleness. He governed his prisoners by awakening in them virtuous sentiments. By this means he obtained such an ascendancy over them that he did not hesitate to let them go outside of the prison premises, single or in companies, under the surveillance of a keeper, to execute various labors. In this manner he so held them to duty by the bond of gratitude and love, that he was never compromised by a solitary escape; for the prisoners knew that by running away they would compromise the responsibility of their benefactor. Compelled at length by the administration to carry out, in all their rigor, mere official and routine regulations, and that, too, despite the exceptional morality and the habit of work which he had introduced into the prison, this model director preferred rather to resign his position than hold it at the cost of putting in practice a discipline which he knew to be detestable. Nor is this the only example that can be cited in favor of the superiority of moral over physical force in subduing and controlling prisoners. The honorable Dr. Wines, in a report, made at a meeting in New York last January, of the result of his voyage to Europe for the purpose of organizing the International Penitentiary Congress of London, referred to the Irish system devised and carried out by Sir Walter Crofton. "Never have I seen, elsewhere," says Dr. Wines, "anything comparable to the intermediate prison at Lusk. Here is a prison which is not a prison, consisting of two iron tents capable of accommodating a hundred inmates, and a farm of two hundred acres—an establishment without bars, bolts, or inclosing walls; and yet, in fourteen years not a dozen escapes have taken place, thus proving the dictum of Dr. Wichern, that 'the strongest wall is no wall;' in other words, that a wall of influence is stronger than a wall of granite." This is precisely what has been said by M. Vacherot, of the Institute: "Attraction in the realm of mind is the greatest directing force—the surest means of government."

It is not claimed that all criminals are capable of being improved, reformed by moral treatment. This system, although the most rational, will not always succeed. The moral nature of assassins and habitual criminals is so bad that they will sometimes continue rebellious to the end. Nevertheless moral treatment, surrounded by the necessary precautions, ought still to be tried upon them, and may produce marvelous results. However that may be, the criminal ought to re-enter society only when he has given guarantees of safety by his good conduct and industry, either in the prison itself or during a period of provisional liberty, and not at the end of a time fixed in advance by the law, as is the case in the system which makes punishment its sole aim. In a better system, which raises the penitentiary question to the rank of a science, each prisoner should be studied individually and treated according to his character and according to the degree of moral idiocy with which he is affected. To treat all criminals in the same manner is as absurd as would be the proposition to cure all the diseases of the body, diversified as they are, by the same medical agents. It is in making these principles the starting-point—principles based on a conscientious psychological study of criminals—that we shall, little by little, be able to see crime diminish in frequency. I cannot too earnestly recommend this study. The proposal to build any system of criminal treatment whatsoever without giving it a scientific basis is a proposal to rear upon shifting sands a structure that shall be solid and enduring.

Eminent men, inspired by the noblest instincts of the heart, by pity

toward beings morally feeble, have undertaken, by gentle and loving means, to lead them to a regular and virtuous life. In employing a system opposed to official rigor they have succeeded in their attempt. What these benefactors of the human race have essayed under the sole inspiration of their feelings is precisely what is taught by cold, hard science, that is to say, a criminal treatment inspired and guided by a knowledge of the psychical state of criminals and of the laws which govern the moral world. In effect, it is impossible that science should find itself in antagonism with the highest moral teaching, viz, to render good for evil. Science demonstrates that society, in its own interest, should employ toward the man who has injured it a treatment which, though marked by the utmost firmness, shall be, at the same time, humane and charitable.

2. ON THE TREATMENT OF LONG-SENTENCED AND LIFE-SENTENCED PRISONERS.

By Mary Carpenter, England.

The right treatment of prisoners condemned to confinement for life, or for so long a period as to be virtually tantamount to this, has never yet received special attention in public discussion on prison discipline.

It was thought expedient by those who prepared the programme of the recent Prison Congress at London, that this first meeting of the kind which has ever taken place in the history of the world should not be embarrassed by the introduction of any topics likely to involve considerable differences of principle and practice; it was therefore determined that the subjects of inquiry should be confined to the general objects of prison discipline and the reformatory treatment of offenders, whether adult or juvenile. Thus was obtained from that most important assemblage, which represented the whole civilized world, an acceptance and declaration of principles which will serve as a basis of future legislation in every country. Those persons who are cut off from society for their evil deeds, and who are briefly denominated "convicts," can no longer be ignorantly treated in a manner calculated to produce the most injurious effects on society, as well as on themselves. The public has had light thrown on the whole subject, and it is for them to require that the treatment of those who must be returned to their midst shall be such as to give reasonable ground for hope that they will return better, not worse, for their imprisonment. Such is not, however, the case with respect to life-sentenced prisoners. The public sees these persons, as soon as their sentence is pronounced, removed forever from among them. *They will never again take their place in society.* They may even be regarded, and are so by law in some countries, as absolutely dead to the world. The nature of their subsequent life is quite unknown to the public, who cannot intrude on the secrets of the prison house; they cannot make their voice heard to tell of the misery they endure; they will never go forth to say what they have suffered. But the present age requires that the treatment of such persons should be the subject of very special consideration, for the number of them will be continually increasing, as the barbarous death-penalty disappears from the code of civilization. *It is disappearing, and must continue to do so,* as education brings enlightenment with it, and the public mind comprehends the true ends of punishment. The gibbets placed conspicuously on a high hill to scare evil-doers with the sight of decaying corpses are moldering away, and stand only as beacons to mark the progress of society. In

Great Britain, which unhappily still lingers, the ghastly spectacle of an execution is no longer paraded before the public, but is hidden in a horrible seclusion; in a neighboring country the continual legal massacres which are still appalling distant lands have not yet ceased to render the public mind callous, if it is not anguished, by their frequent occurrence. We shall aid the abolition of this inhuman punishment, if we can point out a way in which the ends of justice can be served without it.

It is, then, the object of the present paper to consider the difference which exists between life-sentenced and ordinary convicts; next, to consider the principles which should guide us in their treatment; and finally we shall endeavor to show how these principles may be practically developed.

For this inquiry we shall not consider separately long-sentenced and life-sentenced prisoners, because when the *certain* term of detention reaches fifteen years, or even less, the uncertainty of life, and the knowledge of the changes which must have taken place in all ties of family and friendship, even if liberty is eventually obtained, renders the dreary future as appalling as if it were certain that death alone will release the unhappy prisoner. We shall therefore here speak only of "life-sentenced prisoners."

Now, when we consider the treatment of ordinary convicts, we regard them generally as habitual criminals, such being usually the persons sentenced to a term of years in a convict prison. The cases in which persons are so sentenced for a first offense are exceptional ones. The ordinary convict may be thus described: The habitual offenders who constitute the largest proportion of the inmates of convict prisons are in a state of absolute antagonism to society and disregard of ordinances, human and divine. They are usually hardened in vice, and they concern themselves with the law only to endeavor to evade it. They dislike labor of all kinds, and to supply their own wants exert themselves only by preying on the property of others. They are self-indulgent, low in their desires, ignorant of all knowledge that would profit them, and skillful only in accomplishing their own wicked purposes. Such is not necessarily the case with life-sentenced prisoners. The crime for which this sentence is inflicted is commonly murder, and this crime involves very different degrees of criminality in the several cases, and does not indicate in itself the type of character usually found in the convict prisons. At the same time it shows a mental and physical condition most dangerous to society.

Now, in the treatment of both classes of these criminals the same grand objects should guide us—the protection of society, the minimizing of crime, and the reformation of the offender. It has been shown in the Crofton system of prison discipline how all these may be harmoniously combined. But it is the great aim of ordinary reformatory prison discipline to restore the offenders to society and to obliterate, if possible, the memory of his crime by the entire change in his future life. In effecting this reformation *hope* forms a most important element of treatment, and the daily effort to attain the desired result of the remission of sentence, with other advantages to be enjoyed, especially the attainment of liberty, constitutes the most valuable part of prison training. But in the case of the life-sentenced prisoner, supposing the crime to be murder or some other horrible offense, the memory of it can never be effaced, though repentance may draw a veil before it; society will *never* receive him again, however penitent; no efforts of his can obtain his release; and hope, the grand spring of human action, is

withdrawn from him. The condition of mind in which he is therefore necessarily plunged is one which must render him a burden to himself and a dangerous associate for others. Then, again, the ordinary convict is probably not in general much tormented by the reproaches of conscience. It is not until he has made considerable progress in reformation that he can see in its true colors the evils of his past life and feel remorse for it. But the crimes which receive the award of confinement for life are usually of a kind at which human nature revolts when not under the *immediate* thralldom of violent passion. The secret anguish of remorse so truly described by our own Shakespeare, in his *Lady Macbeth*, must constitute a source of life-misery.

The first murderer, when informed that his life would be spared, exclaimed in the agony of his spirit, "My punishment is greater than I can bear." And the same has been felt by others who, under commutation of sentence, have found the pangs of a guilty conscience in a convict prison more than they could bear, and have committed suicide. Again, the ordinary condition of habitual criminals may be calculated on, and a system of discipline may be arranged for them accordingly. But the crimes which are followed by a life-sentence are very frequently regarded as symptoms of insanity, either temporary or the result of unbridled passions which have destroyed the mental equilibrium; they require special treatment, and for want of any such provision are placed in a criminal lunatic asylum, though in no other respect than the crime they had committed did they show indications of mental aberration.

It is evident, then, that these two classes of convicts are totally distinct, and require a kind of treatment of a very different nature. The very presence of one class with the other is injurious. Every one conversant with prison management is fully aware that the mixture of short-sentenced prisoners with convicts is detrimental to the discipline and order of a jail; the difficulty is not less which is caused by the presence of life-sentenced prisoners, who require, and who ought to have, very different treatment from ordinary convicts. *There ought to be a separate place, in every country, where life sentenced prisoners can be placed to receive appropriate treatment.*

Let us now consider what are the principles which should guide us in our treatment of them.

First. There must be protection to society from any danger arising from the escape of such prisoners. Security is always a very important element in penal discipline, and in this case especially so. The dreadful tragedy by which India was recently deprived of her illustrious viceroy ought never to have taken place. A known murderer, however mild may have been his general demeanor, should never have had the possibility of escaping from surveillance, and availing himself of deadly weapons, especially at a time of peculiar excitement. No one can tell what are the secret workings in the murderer's heart, or the craft with which he can conceal them. The protection of society is of course an important object in all penal discipline, but in this case especially.

Secondly. The deterrent effect on society of the treatment of these life-sentenced prisoners exists solely in the fact of their removal *forever from the world*. The special treatment must be regulated not only so as to secure the personal safety of the prisoner, but at the same time to promote his reformation, as a primary object.

Thirdly. With a view to this last object, the whole system must be so arranged in its different parts as to infuse the *element of hope* into the prisoner from the very commencement of his incarceration. The awful

sentence, "Who enters here, leaves hope behind," placed by Dante over the entrance to his Inferno, must have no place here. Humble penitence for past evil, with deep sorrow for sin, must be blended not only with hope of pardoning love in another world, but also in this. Hope must be excited of the possibility of regaining some happiness even in this seclusion, and even of making some small restitution to injured society.

In order to make myself better understood, I shall here, before stating what I conceive should be the practical development of a prison for life-sentenced prisoners, mention two cases which came under my own observation in a recent journey on the continent of Europe.

The first case was that of a man who was sentenced to twenty years' imprisonment for murder. He was in a jail where strict discipline on the Crofton system was carried out, as far as it could be in buildings not arranged for the purpose, and without any intermediate stage. An excellent tone pervaded the place, and the associated labor had a very good influence on the prisoners, in whom, generally, there evidently existed a desire to do their duty. The director, a gentleman who devoted himself to the well-being of the prisoners and took a strong personal interest in them, informed me that this man had been there for two years, and had eighteen more to remain; that he labored under deep and morbid depression of mind, from which he could not be roused; the future was dark and dreary before him; it was not probable that he would live to regain his liberty; and if he did, what happiness would he have when all his friends would probably be dead or dispersed? The director had tried to place him in associated labor to relieve the gloomy monotony of his life, but his irritable disposition compelled his removal from it. The director asked me to see him. I went to his cell, and found him as described; skilled labor had been provided for him, but there was deep gloom around him. I addressed to him such religious observations as seemed appropriate to his case, and he seemed comforted. The next time I heard of him he was ill. The director found his presence a great difficulty in the management of the prison, nor could he deal with him as his judgment would direct, under such circumstances.

The other case, in another city, was that of a female poisoner who had been confined already eighteen years. The prison where I saw her was a temporary one, formerly a lunatic asylum, and there did not appear to be any attempt to carry out a system in the management of it. I was accompanied by a gentleman resident in the neighborhood. A male official introduced me to the small room where the poor woman was confined. She was in a nervous, dejected state, and said she could not do the work, which lay untouched on her table, from a weakness which evidently arose from dejection. She seemed thankful for sympathy. She complained that she had often been accused of committing, in the prison, offenses of which she was innocent. She had no friends, or relatives, except one son, of whom she knew nothing. It was difficult to know what to say to her. After I left her, and the official had again confined her in her dreary solitude, we heard her singing in a wild, maniacal manner. My friend and I thought that immediate death would have been a more merciful infliction on her than this protracted mental torture. I did not desire to see another female prisoner in the same jail, who had committed many murders. A gentleman afterward told me that he had visited her, and found that a young woman was confined in the same cell with her. I requested my friend to intercede with the proper authorities for a mitigation of the punishment of the poor woman I had seen. He afterward informed me that this was useless, as she was subject to violent paroxysms of passion, requiring sev-

eral men to hold her. Both had done very malicious bodily injury to female officials.

It will surely be acknowledged by any one who carefully considers these two cases, which probably are not equally painful with many which exist in various countries, that the abolition of capital punishment absolutely requires us to consider what is the true treatment of such persons as those to whom it would formerly have been awarded. The civilized world no longer tolerates the infliction of needless physical pain as punishment. We shudder at the torture chamber of Nuremburg and the instruments of torture exhibited in our own capital, as relics of a barbarous age; yet we forget that, excruciating as was the pain then inflicted on the body of the sufferer, it would gladly have been chosen rather than years of mental anguish. We behold the dungeons of our ancestors, and the dens where were thrust, wholesale, the intended victims of the scaffold; or the now crumbling towers where a criminal was immured for a short time, to be dragged forth to the place of execution. But *our* whitewashed cells, with their dreadful monotony, in which a human being is confined year after year, without hope of release, *are not really more humane.*

Let us now consider what should be the nature of a convict establishment for life-sentenced prisoners:

Selection should in the first place be made of a proper site. The safety of society is a primary consideration, and the more secure is the locality the less need will there be for those irksome restrictions which irritate the prisoner, and constantly remind him of his situation. If possible, an island should be selected, or, better still, two or three islands, sufficiently near to each other to be within one general surveillance. The choice of the locality should not be guided by the desire to make the residence there as unpleasant as possible, but, by adaptation to the object, to secure the reformation of the prisoner. Barren, frozen regions should *not* be selected, as some have proposed, where the spirit would become as chilled and frigid as the physical frame; nor unwholesome, tropical places, where the influences are so depressing that the inhabitants of the temperate zone *must* pine away and die miserably. Nor must we choose a rugged and desolate district, where not even bounteous nature repays, as is her wont, the toil of the husbandman. The loving heavenly Father doeth good even to the unthankful and the evil; He sendeth His sunshine and rain on the just and on the unjust. We are commanded to be perfect even as our Father in heaven is perfect. *We must strive after this*, and it is not for us to deprive our fellow-sinners of a single good and holy influence which nature would bestow on them. There should be abundance of land, which the labor of the convicts could make highly productive. Such a site should be sufficiently isolated, and yet not so remote as to prevent the frequent visits of persons whose influence would be beneficial.

The whole territory should be so arranged as to admit of three distinct stages, as on the Crofton system; prisons for separate confinement, for associated labor, and for partial liberty, as in the Crofton intermediate prisons. Besides these there should be a *fourth stage, corresponding to liberty with the ordinary convict.* Here there should be little, except the actual fact of prohibition to pass a certain boundary, which should remind the reformed convict, who has attained it, that he is still under sentence of law. The space should be sufficiently large for the life-sentenced prisoner to have his family around him. Remunerative labor should be provided, by which he might be able to relieve society from the expense of his support, and even to repay what has been spent

on him. He might also be permitted to make some provision for his family, and prepare them for their free entrance on life.

It will be remembered that in Sir Walter Crofton's development of his system in Ireland, *the only complete illustration of it existing*, each stage was at some distance from the others, while his own mind kept all in unity. This was attended with very beneficial effects, as at each stage the mind of the prisoner received a new stimulus. This is even more desirable in the case under consideration, where every available stimulus and excitement should be used to supply the place of that great object of desire, the anticipation of release which has been withdrawn.

While the general arrangements of the Crofton system should be adopted in these prisons for life-sentenced prisoners, the stages may be passed through more rapidly, and more privileges may be allowed as the result of good conduct, such as communication with friends, and the purchase of small articles which may relieve the monotony of the cell. There should also be very careful and scientific medical superintendence of the whole. The mind and the body have much to do with each other, and in such cases particularly.

At Ahmedabad, in India, I saw a very remarkable lunatic asylum, conducted by Dr. Wyllie, the able superintendent of the jail of that place. Never have I seen a more pleasing spectacle of willing, cheerful out-door labor than among the patients of that institution; they were not only earning money but bringing their physical and mental powers into harmonious action. Among these the doctor pointed out to me a class of murderers who were working in as orderly a way as the others. The doctor observed them carefully and regularly, and when he saw in any one of them a peculiar appearance of the eye, he put him under medical treatment, and the danger of an outbreak was removed.

The development of such a convict system for life and long-sentenced prisoners in the Andaman Islands was regarded as very satisfactory, when I had the opportunity of making inquiries respecting it, six years ago. The fourth stage was on a separate island, where the convicts lived in comparative freedom. Many convict women were sent out at their own request to become their wives, and the settlement appeared fully to realize the object intended.

The best treatment of life-sentenced women is a problem more difficult of solution than that of men. The subject is too perplexing and important to be here briefly discussed. Suffice it to say that Sir Walter Crofton has proved that it can be solved, and it ought to be considered most carefully in every country. I trust it will receive the attention it requires from those women as well as men whose *sound knowledge, large experience, and devoted, loving hearts*, inspire them with a faith which can remove mountains.

If there are persons who have so little belief in the possibility of overcoming evil with good, of touching the divine spirit which exists in every child of the heavenly Father, however perverted and enthralled by the animal nature and passions, we would ask them to turn for confirmation of the views taken in this paper to a convict settlement in the center of India. It is well known that in that country there was a race of natives, the Thugs, whose very religion and social customs were based on professional murder, the secret of which was transmitted from father to son, and the practice was thus perpetuated from one generation to another. To reform them seemed impossible. The practice formed so completely a part of their nature that when suffering under punishment they would declare that, whenever released, they

must resume the horrid practice. Some forty years ago these Thugs, whenever arrested, were subjected to strict imprisonment and industrial training in a place appointed for them. As they appeared reformed they were admitted to greater liberty, and a village was formed round them, where their families live. Breach of regulations was at once punished with return to strict imprisonment. Various branches of skilled labor have been introduced into this Thug village, at Jubbed-poor, which are now of great importance in a commercial point of view. An excellent influence has been diffused around, and some of those who were born and bred in jail are now among the first and wealthiest in the community. Why should not the same be done for our life-sentenced prisoners?

3. REMARKS ON SUNDRY TOPICS CONSIDERED IN THE INTERNATIONAL PENITENTIARY CONGRESS OF LONDON:

By the Right Hon. Sir Walter Crofton, England.

MY DEAR DR. WINES: I regret very much that it is not in my power to attend the Baltimore Congress. I need scarcely write that I wish it every possible success. I have been ill for several months, and therefore have been unable to attend the Social Science Congress at Plymouth, or to initiate the further discussions which I consider to be necessary with regard to the "International Prison Congress."

It is undeniable that this congress, thanks to your energy, ability, and, allow me to add, *tact*, proved a very great success. It contained elements of discord which might have produced the result of separating without passing any resolutions. It must be our care that those which have been passed should be thoroughly understood.

Already I see indications that the advocates for strict separation until the end of long sentences do not consider that any resolution has been passed by the congress hostile to their opinions. But, if the resolution recommending the adoption of "*progressive classification*" is not opposed to these opinions I am entirely at a loss to conceive its meaning.

To my mind, the tone of the discussions abundantly illustrated that the problem to be solved was not merely the question between "isolation" and "progressive classification," which had been disposed of at an early period,* but the best mode of preparing a criminal for his release, so that on his liberation he should, by his *prison training*, be made fit for the labor market, and employers of labor be induced to assist him.

You will, I know, agree with me that if our prison training does not attain these ends it has accomplished but a small portion of its real work.

I have listened to many advocates of the system of entire isolation, and have read many of their works; moreover, I have noted its results where carried out for lengthened periods, both in England and in Ireland, but I have entirely failed to realize how it would be possible under any artificial system to attain the all-important ends to which I have alluded.

I fully recognize the value of the isolated system from many points of view. The absence of temptations would reduce the number of prison offenses, and render the management of the establishments much easier, and far more agreeable to the officers. The small number of prison of-

*In the United Kingdom, after much experience, "isolation" for long periods of time has been condemned for many years.

ficers, and the general good conduct of prisoners, will of course induce the assumption that amendment has taken place, which, without the test of registration and supervision after liberation, it will be impossible to verify.

I have for too many years struggled with the difficulty of rendering criminals fit for the labor market and inducing employers to give them work, to believe that this great object can be attained by any artificial process in the criminal training. In some communities doubtless there will not be the same difficulty as in others, but in all, to a greater or lesser degree, difficulties will exist. In the United Kingdom, I feel perfectly satisfied that any attempt to liberate men *after a long period of isolation*, with the hope of their attaining employment, would result in a most disastrous failure.

But do not let me be supposed to undervalue "*isolation*" in its place. As the earliest stage of detention, I have the highest opinion of its importance. I believe every system of prison discipline would fail without this preliminary stage for reflection, so specially well adapted as it is for repentance and religious instruction. It should be ever held to be the basis of all prison systems.

You will, I feel sure, agree with me that the great pressure upon the time of the congress, caused principally by the translation of the papers and discussions, precluded the thorough consideration and discussion which some of the subjects imperatively required. Notably there were two subjects, "corporal punishment," introduced by M. Stevens, of Belgium, and "prison labor," by Mr. F. Hill; the arguments concerning which were based upon a complete misunderstanding of the system pursued in this country, and approved by the Government. The names of twelve or fourteen gentlemen were down as desirous of speaking when the discussion was closed by the chairman.

From want of knowledge of the existing practice, the arguments were based on exceptional cases, and went upon a false issue. Under these circumstances, the feeling at the congress was extremely hostile both to the infliction of corporal punishment and to some of the statutory requirements of hard labor, viz, the crank, treadwheel, and shot-drill. Members of the congress spoke as if these were our ordinary forms of punishment and of labor. But what are the facts?

Corporal punishment is retained as a very exceptional and not an ordinary punishment, and is never resorted to save in cases in which a most brutalized nature has been evinced by the offender, and then only by magisterial order accompanied by medical sanction. It is not true that it is in the power of governors of jails to order its infliction, and those conversant with the ordinary practice of the magistracy in these cases will be amazed at some of the opinions expressed in the congress.

There is no person with an opinion carrying weight who would in this country advocate the general use of corporal punishment. At the same time there would be very few of practical experience but would desire the retention of the power under the strictest safeguards, to be applicable only to those exceptional and brutalized natures which will, unfortunately, be sometimes found in all communities. It is believed, and rightly believed, that the retention of the power prevents in many cases the necessity for its use. It has in several instances prevented bloodshed and murder to my knowledge; and you will recollect statements being made to the congress to this effect by Dr. Mouat, (the inspector-general of prisons in Bengal for many years,) and by your own

very able and excellent governor of Albany penitentiary, General Pilsbury.

With regard to "prison labor," there was very much misapprehension also. The prevalent impression of speakers appeared to be that the use of the crank, shot-drill, and the treadwheel is compulsory by statute. This is not true; it is optional with the magistrates either to adopt these forms of labor or others of a character to insure "hard bodily labor." It had been decided by Parliament that before 1865 the sentences of "hard labor" had not been carried out in our prisons, and that so long as we maintained these sentences we must recognize a distinction between "penal" and "industrial" labor.

But the government never contemplated "hard" or "penal" labor to the bitter end. So far from this being the case, the home office transmitted circulars to the "prison authorities," pointing out how it would be possible, under the prisons act, 1865, to establish a prison system which should lead from penal or hard labor, by a progressive classification, to industrial labor and special employments.

Thus, by a well-regulated system, justice would have been satisfied, a strong motive-power to amendment would have been created, and "industrial labor," being associated with privilege in the minds of the criminals, would be followed on liberation with pleasure and with profit.

A large number of "prison authorities" have, unfortunately, not adopted the scheme foreshadowed in the government circular, and allow the infliction of "hard labor" until the end of long sentences. Nothing can be worse than such a course. But it would be entirely wrong to assume that the government approves of such a practice, as many speakers at the congress did assume, and termed it the "English prison system," for we have only to turn to the convict system, which is under the entire control of the government, to learn its views upon the subject of criminal treatment.

What is required is, that the central authority should institute a uniform system of prison treatment, working it out with the co-operation of local action, and we must come to this; as yet, there is not sufficient power.

It is, I maintain, right for the public, and right for the criminal himself, that there should be suffering for sin, that the preliminary period of imprisonment should be one of suffering, not dictated by vengeance, but as an example to others, and a wholesome discipline to the criminal.

Whether this period of suffering had better be one of strict isolation or of "hard labor" is an open question. If hard-labor sentences could be abolished, I should myself prefer isolation. But in either case this treatment must be followed by industrial labor, which must be earned as a privilege. If the whole scope of such a system is explained to the criminal, it is idle to assume that he would consider penal labor as a degradation. He would realize it as a means to an end, and would co-operate with the system. This has been the case in jails which have a progressive system, and it is not right to assume that because aimless penal labor in jails which have no progressive system is felt as a degradation, it must be so under other and very different circumstances. It is important, all-important I would say, to keep penal or hard labor perfectly distinct from "industrial labor" in the mind of the criminal, for it is necessary that he should dislike the one as associated with punishment, and like the other as associated with privilege and amendment. His well-doing, on liberation, depends upon his feeling in this respect; and those who advocate "industrial labor" at the beginning of sentences, without making it the result of privilege, are associating it

in the mind of the criminal with his penal treatment, and giving him a distaste for it on his liberation. Many years' experience has completely satisfied me on this point, and many years' experience should have pointed out the failure of merely industrial labor in England. Before 1865, it was quite an exception to find jails in which *penal labor* was carried out—the results were so bad as to call for an examination by a committee of the House of Lords, the report of which gave rise to the prisons act, 1865. It is notorious that under the former system vagrants used to commit crime to pass the winter in jail, and this has not been the case since penal labor, (which should not be unproductive,) has been made compulsory in all jails.

I am satisfied that any attempt to eliminate suffering from punishment would have such an effect upon public opinion as to very materially damage, if not entirely destroy, our reformatory and progressive system. No one has a greater right to be heard upon this point than myself, because I have carried the progressive system further than any other person, even to a state of semi-freedom. But this would have been impossible, had I not been able to carry public opinion with me, and to show—as Count Cavour expressed it—that punishment and suffering formed a portion of the system. Experience has also shown me that such a course is an essential element in the treatment of the criminal for his own sake.

It is certain that we have much yet to do. Our classification must be perfected and still further extended. Our education in prisons must be rendered more practical, and made to bear more on the future career of the criminal. Above all things, we must have the active intervention of a central authority to compel a uniform system of prison discipline. It is indefensible, that the exercise of an unchecked local authority should be allowed to result in a very different treatment of criminals under the same sentences, for the whole community is affected by this treatment. We cannot confine the action of criminals to their own localities, and, therefore, it is the duty of the state to interfere.

With regard to sentences, also, some reform is needed. It is very generally admitted that short sentences entirely preclude reformatory treatment, for the time is not sufficiently long to develop it. If we could abolish the intermediate sentences between six weeks and six months, it would be far better for the criminal and the public. During six weeks we could inflict isolation and a low diet for the whole term. From six months and upward we could give beneficial effect to a progressive and reformatory system.

Although we have done much of late in establishing Prisoners' Aid Societies,* we have still much more to do in this direction.

Our "registration of criminals and their supervision after liberation," has not only proved a most efficient check on the criminal classes, but it has enabled us to test, in the only practicable manner, the value of our prison training. Under this test we have the most satisfactory results.

Criminal statistics depend for their value upon the basis on which they are collected.

Any comparison of statistics between different countries, some collected under a stringent system of registration, as in the United Kingdom, and others in a negative form, would be worse than useless as tests of prison system. By turning to my Irish official reports, it will be noted that this was my argument against any comparison of results between England and Ireland, for at that time "supervision and regis-

* There are now thirty-six in England.

tration of criminals" had not been adopted in England. When I think of those reports, and the papers I had to write, pleading (for it was nothing short of pleading) for the adoption of the "mark" system of classification, for police supervision, for the registration of habitual criminals, for a reduction in the amount of gratuities, which were excessive, and for a better subdivision of large prisons, and realize what has since been done, that is, the adoption of all the improvements mentioned, you will agree with me that I have reason to be thankful. It is cheering also to find that the mark system has been introduced in some of the jails in India and the colonies, and that Germany has introduced a well-considered system of supervising criminals.

We must hope and believe that progressive classification will everywhere culminate in "intermediate establishments." We can make allowance for a certain timidity in its application to men, but they will come in time as a consequence of the progress which has been already attained. Surely Lusk, with its sixteen years of successful results, cannot be ignored by thinking men, and that it will not be so ignored in the United States, I feel most certain.

It cannot be doubted that we have much yet to do. But we must stand fast to the principles which we have proved to be sound, and build upon them; we must not confine our operations to the treatment of criminals, young or old, inside and outside of the prisons; and we must place in industrial schools the children of criminals whose future career cannot otherwise admit of doubt.

With my best wishes for your congress, believe me, dear Dr. Wines, yours, most sincerely,

WALTER CROFTON.

HILLINGDON, UXBRIDGE, *December 24, 1872.*

P. S.—I have just received the Transactions of the Prison Congress. Not having seen a proof of any statement made by me, I already observe an error on a very important point, which I shall feel obliged by your correcting at the Baltimore Congress. At page 476, I am reported as stating that, for certain reasons, viz, the high earnings in *free life* in England, it would be difficult to carry out intermediate prisons in this country. This would be nonsense. What I said was, that I had no doubt the English prison authorities had this difficulty to contend with in establishing intermediate prisons, viz, that several of the prisoners (who are skilled) earn in some of the public works prisons 5s. or 6s. a day, and that if they were removed to agricultural establishments, as at Lusk, they would probably only earn 2s. 6d. a day. But I stated that, to my mind, the moral gain would quite outweigh the financial result, and I shall be glad if you will make this point very clear.

W. C.

4. PREPARATORY SCHOOL FOR THE TRAINING OF OFFICERS CONNECTED WITH THE PENITENTIARY COLONY OF METTRAY, FRANCE:

By M. De Metz, Director of the Colony.

[Translation.]

PARIS, *December 31, 1872.*

DEAR SIR: Agreeably to your request, I send you a word in relation to the Preparatory School, (*École Préparatoire*), which I thought it needful to found some time in advance of the reception of the first inmates of the Penitentiary Agricultural Colony of Mettray, for the purpose of training agents who should be competent to the duties of their

high mission. This, from the start, I thought absolutely essential, to the end that I might advance, with firm and sure step, in a path then altogether new and untried.

It is thirty-five years since the preparatory school was founded, and time has but convinced me more and more of the advantages which may be obtained by means of such an institution. Still more recently I have had opportunity to observe how much force and energy this school has given to the sentiments of the young men who have enjoyed its advantages. When our territory was lately invaded by the enemy, many of our under-officers promptly joined the ranks of the army. Those who remained, perceiving the difficult position in which we found ourselves from the insufficiency of our staff, and being fully aware of the exhaustion of our financial resources, resulting from the crushing requisitions of which we had been made the object, sent a deputation to me to say: "We comprehend, sir, how great must be your embarrassment; it will cost us no sacrifice to relieve you from it; pay us half of what we now receive, and we will do double work." I accepted their generous offer, and Mettray came victorious out of a trial so menacing to the future of the colony. Would such devotion have been found in men taken, as it were, hap-hazard, which is but too often the case in penitentiary establishments, and who had not early imbibed the sentiment and formed the habit of duty?

It has been said, with reason, that there is no good penitentiary system without aid to discharged prisoners; so there is no good penitentiary establishment, which does not create a nursery of agents from which to recruit its staff. The men who are needed to implant the love of goodness in vicious natures are not improvised, and moral transformations are obtained only through persevering efforts and an enlightened zeal.

May these considerations, which I venture to lay before you, serve to convince you of my desire to justify a confidence which honors me. Be pleased, sir, to receive, in exchange, the assurance of my high esteem and sincere sympathy.

Yours, from the depth of my heart,

DE METZ.

5. SUSCEPTIBILITY OF CRIMINALS TO REFORMATORY AGENCIES:

By Henry James Anderson, M. D.

DEAR SIR: The board of managers of the Protectory desire me to thank you for your invitation to them to participate, through an appropriate delegation, in the good work proposed for the Prison Reform Congress, soon to assemble at Baltimore.

As the Rev. William Quinn, our advisory chaplain, Brother Teliow, our rector and superintendent at Westchester, and the Hon. John E. Develin, our legal adviser, have been delegated to represent us in the congress, they will be prepared to furnish all the detailed information called for by your respective points of inquiry. I venture, however, of my own responsibility, to state the result of some attention to your eleventh point, viz: the susceptibility of criminals to reformatory agencies.

It is essentially necessary in this matter, if we wish to avoid a painful confusion of ideas, to discriminate in the very outset, at least two classes of convicts—those whose crimes have, on the whole, been justly defined by the verdict, and those whose delinquencies, if any, have been very inadequately represented by the finding of the jury or the judge. The penal discipline appropriate to the former class would be hurtful in

the extreme if applied to the latter, whether the verdict overstated, understated, or misstated entirely the nature and magnitude of the offense. I do not mean to say that it would be safe for the prison authorities to question the correctness of the finding; but it is nevertheless true that a severity of treatment, promotive of the ends of justice in the one case, would be totally ineffectual, not to say ruinous, in its results in the other. To save time, I shall therefore confine these remarks to the first class of convicts, those whose crimes shall have been found to conform in the main with the language of their condemnation.

It has been customary to say that the end of punishment is twofold: first, to reform the offender; secondly, to deter from a like offense the thoughtless or the criminally inclined. The treatment of the transgressor should keep a third end in view, the maintenance of a healthy public opinion, not merely in regard to the gravity of the infractions of the law, but equally so with respect to the necessity of fair dealing in enforcing its provisions. All schemes for the reform of the criminal would be more or less incomplete if these considerations are disregarded; but as the eleventh inquiry concerns exclusively the reformation of the criminal, I shall confine myself to this single point.

What constitutes the criminal? Crime implies either a false sense of duty or disobedience to a true one. As against the state, it implies a culpable ignorance of the law or a wilful breach of it. How far there may be crime in obedience to the law or innocence in disobedience, it would perhaps be irrelevant to inquire. To reform the criminal it is at all events necessary that we should reform either his *erroneous* convictions or his proclivity to disobey his *right* ones. Ordinarily speaking, all true reform demands, on the part of the reformer, a disposition and ability to accomplish one or other of these tasks; and on the part of the transgressor a disposition and ability to look to the moral teacher as his counselor and friend. No real amendment can be hoped for where this relation is not substantially established. The criminal must have for his reformer one whom he *actually trusts and respects*, one whom he believes *means well*, even when the treatment seems severe. So true is this that where this condition is wanting, no amount of benevolence or zeal on the part of the instructor can make up for the defect. All the devices of mere physical appliance, so idly relied upon as efficacious and so often invoked as miraculous or infallible in their effects, are worse than nothing where they work upon *an adverse will*. In the great majority of cases they serve only to harden the offender, who is in fact logical in his contempt of such expedients, as they are in no way calculated to remove his *false* beliefs or to inspire him with loyalty to *true* ones. This is the secret of a trusted mother's influence. This, and this alone, can explain the acknowledged failure of so many well-meant schemes of reform, though sustained by the subsidies of the wealthiest states and the cheers of a world of blinded applauders. The unhappy wanderer who has gone far astray must *believe* in his guide, or he will not follow him; he will not even *listen* to him, and if the unwelcome educator resorts to the use of force and comes to grief in the encounter, the sympathy of the stander-by is very sure to be on the side of the unpersuaded one, *whatever be the style of his resistance*.

It would, however, be wrong to say that punishment has not its uses, or to assert that it can never tend to the true correction of the vicious habits of the offender. Even where punishment but confirms the criminal in his perverseness, it may be necessary as a part of penal discipline. Nevertheless, on every occasion of this sort the difference is immense in results between the system of correction which is appre-

hended by its subjects as coming from a *respected authority*, and that more popular off-hand dealing with delinquents which regards the disgust of the refractory impenitent as a pleasing feature in this less scrupulous method of conversion.

Where the punishers (justly or not, makes little difference) are regarded by the punished as belonging to an order, unsympathizing at least, if not absolutely hostile or unfriendly, it is clear that, under such circumstances, the subject of the most necessary discipline will misconstrue the motives and passionately resent the acts of his correctors. And those who are intended to be warned by these corrections will find all sense of their necessity lost in the sense of their injustice. On the contrary, in reformatories where the inmates (whether for offenses committed before or after confinement) are assured, by evidence or tokens with which they have been previously impressed and familiar, that they are in the hands and subject to the discipline of *friends*, they will cheerfully submit to any measure of coercion deemed necessary, either for their individual correction, or for the maintenance of the general order of the house.

In offering these remarks I wish to be understood irrespectively of the special merits of the *class of reformers* which may have previously gained the confidence of the *class to be reformed*. For the same reason which insists that the child is safer, on the whole, with an indiscreet or over-indulgent mother than with a guardian, however gifted, having no acquired or natural affection for her ward, so it may be assumed that the state will fail of securing the proper training of its delinquent children, whether juvenile or adult, if it neglects to see that each class of these unfortunates is committed to the care of their trusted spiritual protectors. Whether this sympathetic tie be one of nationality, or language, or manners, or religious convictions, or even of mere ritual forms, there is more safety in consulting this affinity than in defying its requirements. Of course there is nothing in this statement that would oblige us to extend it to classes sanctioning or seconding the vices designed to be reformed. The state has a right to require that the guardians, while they show how much they love the *persons* of their wards, are the determined enemies of their faults. And to this end, no class or sect of reformers or protectors should ask to be relieved from giving proof that they have ever made war against the special misdemeanors which have consigned these special offenders to their care. Subject to the strictest scrutiny in this regard, the cure of vices or vicious habits of thought might be left (with hopes of success far exceeding what has hitherto been achieved) to those who are prompted by love and enabled by early intimate relations to cure the infirmities and amend the lives of their pupils, and even to eradicate the false maxims and *dangerous theories of right* by which the criminal is ever attempting to justify his fault.

I repeat again, I have no wish in this argument to present any claim of superiority of method on the part of any *school of reform*. I know of none so *admittedly superior* as to justify the placing of disaffected subjects under its control. Least of all do I wish to see all classes of transgressors, widely differing in their early prepossessions, brought, as they often are, indiscriminately under the only prison reform party which aspires to the exclusive favor of the state; I mean that party (professedly against discriminations) which itself discriminates against all influence derived from considerations of superhuman or supernatural control.

Nor am I any more disposed to see violators of the law, with con-

sciences as divergent as their crimes, with inbred convictions, settled maxims, and cherished delusions as various as their faces or their names, driven helplessly to that most hopeless of moral disciplines, the hearing (under constant and angry protest) of the vapid platitudes of any short-creeded and narrow-minded sect that plumes itself upon being no sect, but rather *an enemy of all*. Far better than this expedient (the most distasteful and the most illogical of any yet tried) is the method of classifying, as far as practicable, the erring children of crime, and of bringing daily each separate class, even if in the main they live together, under the influence of the teaching which alone they can profitably understand. To say nothing of the generous rivalry which might thus be kindled and sustained, the real experience of the world is in its favor, for no success has as yet attended the novel experiment of turning religion out of doors, or the other equally novel one of leaving to the state the choice of a prison creed, and the selection of a catechism the best adapted to contradictory beliefs. If the state abandons, as it ought to do, all attempt to discriminate for or against any religious teaching in its reformatory institutions, let it apply the subsidies it now requires in order that "no particular religion" shall be heard by those who need it most, to the support of as many charities as will be raised in its aid, by those who wish to reach the hearts and consciences of the unfortunates of their own special faith.

Protestant or Catholic, Jew or Gentile, followers of a church which knows no change, or adherents of views which have no continuity or rest, let our prisoned children be educated by their own spiritual mothers; and where they are orphaned by the absence of any such maternal influence, in the name of mercy and humanity permit them (if young) to be taught as their natural guardians may prefer, and (if adult) let them freely give their hearing where they give their hearts, without restriction or dictation from the state, which has never ceased to reaffirm the American principle that, in such selections, the civil power has neither competency nor jurisdiction, nor even a desire to interfere.

With great respect, I remain, yours, &c.,

HENRY JAS. ANDERSON,

President New York Cath.-Prot. Office, 29 Reade street,

New York, January 18, 1873.

Rev. Dr. E. C. WINES,

No. 194 Broadway.

6. DUTY OF SOCIETY TO PERSONS ARRESTED BUT NOT YET BROUGHT TO TRIAL:

By Wm. J. Mullen, prison agent, Philadelphia.

PHILADELPHIA, January 11, 1873.

RESPECTED SIR: Your favor of the circular informing me of the time for the assembling of the Prison Reform Congress at Baltimore, on the 21st instant, has been received, and for which you will please accept my thanks. I am sorry to state that circumstances beyond my control will prevent me from being present at the congress. I heartily approve of the object, and am quite sure that good results will follow the deliberations and action of the congress. It cannot be otherwise. The united efforts of the wise and good, assembled together for such a merciful object, will certainly be attended with divine blessing, that will not only result in accomplishing much good for unfortunate prisoners who may be benefited by the action of the congress, but will also prove benefi-

cial to each member of the congress, who will esteem it a privilege to participate in so benevolent and God-like a work.

There is a subject which, I think, has not received that attention which its importance demanded from the different conventions that have heretofore met on prison reform. It is that of untried prisoners, whose cases should, in every instance, be thoroughly investigated by a competent prison agent before going to trial. Such investigations as have been made by myself in our Philadelphia county prison have prevented the conviction of thousands of persons, who might otherwise have been condemned without such investigations. The friendly interference of an intelligent and disinterested agent, in behalf of the accused, who may be incarcerated, friendless and helpless, and without the means of proving his innocence, in such cases, may result in securing his acquittal, by supplying him with counsel to properly explain his case to the court and have his witnesses present at the time of trial. All well-regulated prisons (in my judgment) should have such an agent, who should make it his special business to do all in his power, in a proper manner, to prevent improper convictions. That has been done effectually in the city of Philadelphia, with the unqualified approval of our highest authorities, from the governor down; and this, too, without impairing the administration of justice; as may be seen in the fact that our criminal judges are united in affording the agent every facility, in his investigations and labors, that is not inconsistent with justice. The court has assigned the agent a position inside the bar, by the side of the district-attorney; and in this way every opportunity is afforded the prisoner to show his innocence. With these facilities, the agent has succeeded in causing the liberation from prison of 32,474 persons within the last nineteen years. Of this number 2,440 persons were liberated through me during the past year. How many of these would have been convicted and caused to undergo unnecessary suffering in prison without this friendly interference of the agent, is a question not easily answered. I have no doubt but that there would have been many thousands convicted out of the whole number, dating from the commencement of the agency. The most of these cases were settled by the agent, with the consent of all parties concerned, before the magistrate, without having been sent to court, the charges having been shown to be so frivolous as to be unworthy of the attention of a jury. The saving in money to the taxpayers of our city, in the release of these prisoners, that would have been required to be paid for food while waiting in prison until the earliest period they could be tried, and what it would have cost to ignore their bills, would have been \$326,112.02. I give this information to show the great amount of good that may be accomplished by the interference of a judicious prison agent. In my judgment, you could not do a better thing than to bring this subject prominently before the prison congress for their consideration. It is a great thing to do all that can be done to ameliorate the condition of convict prisoners; but it is a much greater thing (in my judgment) to prevent an innocent man from becoming a convict and being made to suffer unjust imprisonment. The press of business in our criminal courts, and the hurried manner in which cases are necessarily disposed of in most instances, have been shown to result in the conviction of many innocent persons, whose innocence I have often succeeded in proving to the entire satisfaction of the court, after their conviction. This resulted in the reconsideration of their sentence and their honorable discharge from prison.

The great cause of crime amongst us is intemperance. Nine-tenths of all who are committed to our prison are sent there either through intemper-

ance in the prisoner or the person who caused him to be committed. If the congress would take some action on this subject it would no doubt be attended with good results. Of the half million of persons who have been committed to our county prison within the last twenty years, there have been about 500 committed for murder; 700 additional for attempting to murder; over 40,000 for assault and battery; and over 200,000 for drunkenness. In nearly every case of murder, or where there was an attempt to murder, the parties were intoxicated. Intoxicating liquor is not only a great enemy to the church, but it is the great cause of suffering to humanity. All conventions and all good citizens should speak out against this crying evil, which has done so much toward filling our prisons, almshouses, and lunatic asylums.

In conclusion, I would say that you are at liberty to make what use of this letter you (in your judgment) may think best.

With the hope that the above information may be of some service, I have the honor to be, dear sir, yours, very respectfully,

WILLIAM J. MULLEN.

7. INTEMPERANCE AND CRIME:

By Aaron M. Powell, of New York.

Among the various exciting causes of crime unquestionably the most prolific is the use of intoxicating liquors as a beverage. The testimony to this effect is most abundant.

Lord Chief Justice Sir W. Bovill, an eminent English judge, writing to the venerable archdeacon of Coventry on the relations of intemperance to crime in Great Britain, says: "Amongst a large class of our population intemperance in early life is the direct and immediate cause of every kind of immorality, profligacy, and vice, and soon leads to the commission of crime."

Another eminent English jurist, Lord Chief Baron Kelly, says: "I can only express my belief, indeed I may say my conviction, that two-thirds of the crimes which come before the courts of law in this country are occasioned chiefly by intemperance."

Still another, the Right Hon. Sir H. J. Keating, adds his weighty testimony as follows: "I should suppose the testimony of every judge upon the bench would be the same as to the fact that a very large proportion of the crimes of violence brought before us are traceable, either directly or indirectly, to the intemperate use of intoxicating liquors. In my own experience of more than nine years upon the bench, corroborated by a very long experience at the bar, I have no hesitation in saying that such is the case. Some of the saddest cases with which we have to deal are those in which men go into public houses respectable and respected, and come out felons."

Police Magistrate Raffles, for the borough of Liverpool, says: "The truth has been so universally acknowledged by all our judges of the superior courts, and by those who have presided over our sessions courts, that I can add nothing to give weight to what has been taken from them, viz, that drunkenness is the cause of nine-tenths of the crime which exists in this country. I can but confirm the sad conclusion. Perhaps I have seen as much of it during the last nine or ten years as any one."

Lord Chief Justice Bovill adds to his own the following testimony, which I quote from the official presentment of a grand jury of Leeds: "The grand jury having again, as on many previous occasions, had

their attention called to the large number of crimes of a serious character whose origin is traceable to beer-houses, desire to express their strong opinion that some alteration should be made in the existing system of licensing, with a view to place beer-houses under such supervision as would check the evils now so grievously complained of."

An English prison chaplain says: "About five hundred prisoners are annually admitted into this prison, and I consider about four hundred are the victims of intemperance."

Another says: "I have no doubt but that intemperance, directly or indirectly, is the cause of nine-tenths of the committals to prison."

A governor of an English prison, writing of his charge, says: "Since I have been appointed to the charge of this prison I have had under my charge eight hundred and forty-one prisoners, and all the crimes have been committed when under the influence of intoxicating liquors, with the exception of twenty-six."

While in attendance upon the international prison congress, held in London in July, 1872, with this subject then upon my mind, I took occasion to consult distinguished delegates who were present from various countries, as also in journeying and sometimes visiting prisons in a somewhat extended European tour, and the testimony of all showed at least three-fourths, and often a much larger percentage of crime, to be traceable to intoxicating liquors as a primary cause.

I will now cite briefly the testimony of a few competent witnesses as to our experience in this country. And first I will quote from a document published by authority of the legislature of the State of New York, the twentieth annual report of the executive committee of the prison association of New York, the following: "There can be no doubt that of all the proximate sources of crime the use of intoxicating liquors is the most prolific and the most deadly. Of other causes it may be said that they slay their thousands. Of this it must be said that it slays its tens of thousands. The committee asked for the opinion of the jail officers in nearly every county in the State as to the proportion of commitments due either directly or indirectly to strong drink." On a preceding page is the following: "Not less than sixty thousand to seventy thousand human beings, men, women, and children, either guilty or arrested on suspicion of being guilty of crime, pass every year through these institutions. The judgment of these jail officers varied from two-thirds as the lowest estimate to nine-tenths as the highest, and on reducing the several proportions to an average, seven-eighths was the appalling result obtained."

The Rev. William M. Thayer, the secretary of the Massachusetts Temperance Alliance, in his official report for 1872, referring to the House of Industry, and other public institutions of Boston, says: "Of the total commitments to the House of Industry, for the year ending May 1, 1872—amounting to 4,417—all but 305 were for drunkenness, and offenses caused by drink. The records of the public institutions of the city show that 95 *per cent.* of all the arrests, of late, have been for drunkenness, and crimes caused by intoxicating liquors."

Governor Washburne, of Massachusetts, still more recently, in his message at the opening of the legislature now in session, in referring to the beer-shops and the liquor question, says: "If we are to accept the evidence of those who have had the most painful experience of the miseries produced by these places, they are among the greatest obstacles to the social and moral progress of the community. The testimony of criminals of every degree is, that they were drawn, by frequenting beer-houses, into offenses and violations of law of which

they might otherwise have remained innocent. The wise and prudent legislator will not cease his efforts for the diminution of crime till every measure has been adopted which experience proves needful."

I might, if the limits which I propose for this paper permitted, quote voluminously from the official records of the courts, State and municipal, of almost every State in the Union, a mass of testimony, all bearing upon this point, and showing throughout the close connection between intoxicating liquors and crime. I will venture to cite the recent experience of Boston in connection with the late destructive fire. In the great emergency created by the fire, and with a large influx of thieves from New York, every precaution to prevent disorder and riot became necessary. An edict of absolute prohibition was issued by the city authorities against beer and all other intoxicating liquors, which was in force ten days. The chief of police of Boston, E. H. Savage, esq., thus testifies as to the diminution of arrests, even with the greatly increased liability to criminal disorder, during the ten days of prohibition. He says: "For the ten days preceding the order, viz, from November 2 to November 11, inclusive, the records show the whole number of arrests to be 1,169. For the ten days in which the order was in force, viz, from November 12 to November 21, inclusive, the records show the whole number of arrests to be 675."

In Massachusetts, at the present time, the liquor traffic is carried on chiefly in what are called "beer-shops," the towns voting annually upon the proposition whether they will or will not authorize the sale of beer. As the mercury in the thermometer indicates the rising or falling temperature, so do the court-records of these towns as sensitively indicate the state of the liquor traffic. It is understood that those who know how to say beer with the right inflection can obtain almost any kind of liquor desired at these licensed shops. I will cite but a single illustration. "In 1871 the city of Taunton voted 'No beer.' The number of arrests for drunkenness from May 1 to December 31, 1871, was 290. In 1872 the city voted in favor of the sale of beer, &c. The number of arrests for drunkenness from May 1 to December 31, 1872, was 492, being an increase over the previous year of 202, or about 70 per cent."

Governor Dix, of the State of New York, in his recent message to the legislature now in session, calls attention to the alarming prevalence of crime in the city of New York as follows: "The alarming increase in frequency of the crime of murder in the city and its environs demands your most serious consideration. Scarcely a day passes without witnessing a brutal, and in many instances a fatal assault, upon the persons of unoffending individuals, usually in drinking saloons."

Rowland Burr, esq., for nearly twenty years a magistrate at Toronto, stated to the Canadian parliament "that nine-tenths of the male prisoners and nineteen-twentieths of the female are sent to jail by intoxicating liquors. In four years there were 25,000 prisoners in Canadian jails, of whom 22,000 owed their imprisonment to drinking habits."

I will only add in the way of testimony that I understand the very recent message of the mayor of this city of Baltimore enumerates an aggregate of some 10,000 arrests for the past year, about 8,000 of which are to be ascribed, directly or indirectly, to the use of intoxicating liquors.

Do we seek the prevention of crime? Would we extend due protection and encouragement to discharged prisoners? If so, we have a twofold duty: first, to protect the weak from unnecessary temptation by a wise policy of legislation; and, second, to employ the ministrations of genuine, practical religion.

If government may arrest and restrain the criminal, it may interpose its beneficent authority to remove palpably demoralizing agencies; it may close the wide-open doors of temptation. If it may blow up and destroy blocks of magnificent buildings to save a city from conflagration, it may not only organize and sustain a vigorous fire-department, but also prohibit altogether a particularly dangerous fire-inviting architecture. That is a poor type of statesmanship, scarcely deserving the name, which deals only with results, and does not at the same time look at and give due consideration to their producing causes. None should be permitted to prosecute a traffic for the sake of gain by pandering to the vices and inflaming the passions of those who are weak or criminally inclined. As infected ships are quarantined in the interest of the public health, so must be the grog-shops and drinking-places for the protection of the weak against undue temptation, as well as society against the depredations they may be expected otherwise to commit.

Most important of all is the religious obligation imposed by the high ideal of Christianity toward those who have gone astray and who are most exposed to wrong-doing. In the administration of prison discipline it prompts to justice, firmness, and kindness judiciously blended; in caring for discharged prisoners, it prompts to extend the helping hand to those sorely needing assistance in taking the first step aright in returning again to society from their incarceration; but especially does it exact of us all, in the presence of such responsibilities, right precept and example. Is strong drink the besetting sin of the criminal classes? Does it cause our brother or sister to offend? Then is it our religious duty to do what we may, each in our own way and sphere of activity, to discourage the drinking usages of society. How frequent and how sad are the falls from high social position to the deepest depths of misery and crime. How many households with haunting skeletons of the worse than murdered victims of the drink-demon. Especially should there be thoughtful consideration of the young. To them, and to all, we should exemplify and teach temperance, truthfulness, and brotherly kindness, and thus build upon the solid foundation, forestall crime, and inaugurate the era of a true Christian civilization.

8. PRISON REFORM IN PENNSYLVANIA.

The board of public charities of Pennsylvania, through its president, the Hon. George L. Harrison, submitted to the congress a summary of views and suggestions contained in its report for 1872. This paper, slightly condensed, is as follows:

It states the opinion that, in dealing with crime, preventive rather than curative measures ought to be mainly relied upon, among which it enumerates the following:

1. A thorough system of universal education.
2. Special and effective agencies for the care of truant, vagrant, neglected, and overtasked children.
3. A much larger provision of reformatory schools and houses of correction for the various grades of juvenile offenders.
4. Provision for the proper care of the helpless and pauper classes.
5. Effective laws for the suppression of intemperance.
6. Adequate provision for the restraint and employment of all idle vagrants.
7. Provision, in the county and municipal prisons, for the separate treatment of vagrants, witnesses, and persons charged with crime, as well as convicts.

The remedial system, or prison discipline proper, should be based on the fundamental principle of reformation through punishment, and not of punishment as an end. Such a system should contain, among others, the following features :

1. Sufficient provision for the separate confinement of each prisoner.
2. After a suitable period of separate confinement and the performance of certain prescribed tasks, provision should be made for the employment of the convicts in voluntary productive labor, as a means of moral improvement and a preparation for their future self-support.

3. Unless solitary labor should be preferred by the convicts, this labor to be performed in small companies or families, properly selected, the members having free intercourse together, and being mutually responsible for each other's conduct.

4. The proceeds of the labor to be appropriated: *a.* To defray the current expenses of the convict, and to indemnify the State. *b.* To contribute to the support of the convict's family, if necessary. *c.* To the convict himself, to go partly to form a reserve fund against the time of his release, and to be used partly as he may choose for procuring present alleviations and comforts.

5. Instruction should be given to all the convicts as they may need: *a.* In some trade or handicraft. *b.* In the elements of learning and knowledge. *c.* In the principles and practice of morality and religion.

6. Considerate and humane treatment to be emphatically insisted on, using, as far as possible, moral influence instead of physical force, and endeavoring, above all things, to develop the self-respect and manhood of the prisoners.

7. A careful classification of the prisoners to be constantly kept up, and from time to time corrected—a classification based not upon any extraneous or arbitrary considerations, but upon character and conduct.

8. Provision to be made for securing a corps of judicious and, eventually, experienced prison keepers, so as to render the profession of prison-keeper honorable and respected, to which end special schools for their education and training should be established.

9. The substitution of meritorious conduct and probable reformation for mere lapse of time, as the ground of final discharge; that is to say, until convicts have earned their release by such evidence of good conduct and habits as will rationally imply their permanent reformation.

10. There should be, in the case of each convict, a certain time-sentence, graduated according to his offense, but always long enough to give full opportunity for reformatory processes to take effect.

[The board is aware that the ideal perfection of the plan which makes the discharge of every prisoner dependent on his reformation, would require too great a revolution in legal and popular ideas to be as yet expected or asked for.]

11. A system of marks to be instituted which, under fixed rules, may be a guide for classification and rewards, as well as for the final judgment; having a debit as well as a credit side, and providing for loss of standing and class, or even for remanding to the cell, in case of misconduct.

12. Intermediate prisons to be provided, where the prisoners, still remaining undischarged, may be finally tested, by being trusted with a great degree of liberty, and left in large measure to control themselves, under most of the ordinary temptations of free life, yet liable, for unfaithfulness, misconduct, or attempted escape, to be degraded and sent back to begin their work over again.

13. Refuges to be provided for released prisoners, to facilitate their return to society, where they can have, at their own expense, lodging, maintenance, and means of employment, until they can procure employment elsewhere.

The board express the opinion that such a system would, as a matter of course, require unity of control. All the prisons and houses of detention in a State, of whatever kind or class, should be placed under the supervision and general direction of one head or of one board of managers, representing the authority of the State. In respect to all matters of prison construction and prison discipline, the county and municipal authorities should be required to act under direction and control of this central and supreme authority.

9. HOPE THE GREAT REFORMER :

By Hon. B. F. Butler.

MY DEAR SIR: I have but this moment got round to the matter of your inquiry among other more urgent duties. You desire me to state to you the method by which I conducted the military prisons and governed the prisoners during my command of the Department of Virginia and North Carolina, in 1864.

First thanking you for the compliment of commendation of the manner of managing prisoners, I grieve that I shall be unable, being entirely without the statistical details of the subject, to give you any exact statistics. I will try, however, to state, in a manner that will be understood, the plan upon which perfect discipline was enforced.

When I took command in November, 1863, at Fortress Monroe, I found a large number of deserters, thieves, and bad criminals of the Army, sentenced by court-martial to hard labor for longer or shorter periods. They were confined in an old naval depot, known as Fort Norfolk, and their hard labor seemed to be, substantially, sleeping all day and playing cards all night; so that the sentence to hard labor at Fort Norfolk was rather a favorite method of passing their term of enlistment by the wicked and perverse of the army; both may be comprehended under the name of "shirks." I looked around for some suitable place for confinement at hard labor, but found none. I have a Yankee horror of what is known as the "chain-gang," and therefore did not like to work these men chained together. I was told that it was impossible to make them work without paying them wages. Upon that I doubted. I agreed that it was impossible to make men work to any effect without fear of the lash or other punishment, or the hope of some reward. I therefore sent to Massachusetts and obtained some of our Massachusetts correction-uniforms, which consist of a gray and black suit, half and half, cut down the center, and a scarlet cap. I clothed my prisoners in this uniform, which, as you see, was very distinctive. I put them under the charge of the proper officer and a superintendent, who had at first some men to guard them, and put them to work in the spring in cleaning up the streets, and alleys, and lanes of the city of Norfolk, much of it very offensive and troublesome work. I gave those that worked in the midst of nauseous effluvia and in unhealthy situations a ration of whisky; I gave all that used it a ration of tobacco. I saw that they were well fed with wholesome and nourishing provisions. They were taken to their cells at night to sleep, and, after a day's work of ten hours, they were quite ready to do so. I then directed the superintendent to keep a roll of merit of the men, of which they were informed, and empowered

him to recommend me to have stricken off from the sentence not exceeding ten days in each month, according to the diligence and steadiness with which men performed their duty; and in cases of great merit a larger portion of the specified time of punishment might be remitted. In case of refractoriness, solitary confinement, loss of the ration of tobacco, and bread and water, were the punishment.

The sequence—and perhaps I may say the consequence—of this was, that a better gang of laborers, more orderly and more quiet, I have never known. I never lost one by running away; I never had but one attempt to get away, and he failed; and after being shut up a week he begged so abjectly and persistently to be allowed to take his place in the working gang again that it was permitted; and he finally got $33\frac{1}{3}$ per cent. of his time of punishment remitted for good conduct. I even took the gang out into the swamps on the Chesapeake and Albemarle Canal to repair a break, and although the country was overflowed, I only lost one there, and am uncertain to this day whether he deserted or was drowned.

The prisoners under this system did work which, at any reasonable price—and an account was kept with the city of Norfolk of what they did do at a price—would have several times compensated for the cost of their keep. I insisted upon three things: perfect cleanliness and purity in their cells and places of sleep during the night; nutritious and wholesome food three times a day, viz, before they went out, at noon, and after they came back; and diligent, industrious, hard labor of ten hours each day, with a reward for labor that was meritorious by remitting a portion of the punishment.

I have long thought that the system of labor in our prisons, where the laborer had no hope and nothing to labor for, was upon a wrong principle. My acquaintance with prisoners as a criminal lawyer taught me so much. I had an opportunity to try a different theory and availed myself of it, and that is all.

Renewing, my dear sir, my assurances of highest regard and respect,
I am, yours truly,

BENJ. F. BUTLER.

DR. WINES.

19. THE FINAL CAUSE OF CRIMINAL LEGISLATION AS AFFECTING MODES OF PUNISHMENT:

By James Freeman Clarke, D. D.

I. Whatever may be thought of the study of final causes in science, it is certain that, in regard to all social questions, it is very useful to inquire often: What institutions are for? What is the purpose of such and such customs? What is the end proposed by this or that course of action? These questions are the surest tests to apply to human institutions in order to learn whether they are working well or have fallen into ruts, so that things are done to-day because they were done yesterday. If I wish to apply a sharp test to any social arrangement—to a college, a church, a law, a society, a hospital, &c., the best thing to do is to ask, (1.) What is it for? What is its aim and end? And then, (2.) Is it accomplishing that purpose, or is it not?

II. In regard to criminal legislation, several different objects have been assumed. It is important, therefore, to ask what are the true ones, and, among these, which are the most important purposes? Thus criminal legislation is sometimes regarded as penal or punitive. Its object is supposed to be to punish the criminal for his guilt. Again, it is

thought to be reformatory. Its object, according to this view, is to improve the morals of the man who has committed a crime. Lastly, the purpose of these laws is considered to be to protect the community. They are to prevent crime by making it dangerous and disagreeable in its consequences. Let us consider these three supposed purposes of criminal legislation, and find which is the truest and most important.

III. If the object of criminal legislation is to *punish* crime, we naturally ask, what right has society to punish, and how is it able to do so? "Vengeance is mine, I will repay," says the Almighty. Only God can punish justly, for only God can read the heart.

If God has delegated to society the right to punish, he must also have given the power. But evidently society has not the power to inflict just punishment on guilt, since it cannot discern motives nor allow for circumstances. It is obliged to judge the outward action mainly; and its judgments in a moral sense must always be very imperfect. Therefore, though the notion of a just retribution may enter into the idea of criminal legislation, it cannot be its main object.

The argument for punitive legislation has been stated strongly by Victor Cousin, in his notes to the *Gorgias* of Plato. He says, "Justice is the true foundation of punishment; personal and social utility only a consequence. In the intelligence, the idea of punishment corresponds to that of injustice, and when the injustice has been committed in the social sphere, the punishment ought to be inflicted by society. Punishment is not *just* because it is *useful*, but it is *useful* because it is *just*."

No doubt it is true that punishment expresses the moral indignation of the community against crime, and this is a healthy and useful result of punishment. It is good for the criminal to feel that the punishment he suffers finds an echo in the public conscience. Nevertheless, human punishments are so very imperfectly adapted to degrees of guilt, that if moral retribution were regarded as their main object, they could hardly be sustained. It can only be a secondary purpose.

IV. Is, then, the main object of punishment the reform of the offender? But what right has society to assume to itself the moral education of certain persons and sequester them for that purpose, depriving them of their liberty? Is it because they have shown themselves by their conduct to be in great need of improvement? But others need it also, in a less degree; and those whose outward actions have not been so offensive to society may, in their inward character, need reform much more. If the object of penal legislation is to reform the criminal; why select one class of offenses only? Why not imprison the covetous, selfish, untruthful, proud, vain, licentious? They need reform, surely, as much as do thieves and robbers? It is evident, therefore, that the moral improvement of the criminal can only be a secondary object of punishment.

V. The proper end of all human laws is declared by publicists to be the promotion of the temporal well-being of the community. It is also often stated that the proper end of *criminal* law is the prevention of injuries by the terror of punishment. But since crime may be prevented in other ways, a better statement would be that "The object of criminal law is the prevention of crime." This definition excludes the notion of punishing the criminal, and also that of reforming him, except so far as his punishment or his reformation may conduce to the protection of society. These two purposes become secondary and ancillary. Thus the question is simplified and put on a practical basis.

VI. We assume, then, that the object of the criminal law is the protection of the community, by preventing crime. That the community

has a right to *punish* guilt may be questioned. That it has a right to select some bad people to *reform* may be doubtful. But no one can deny that it has a right to protect itself against injury. If criminal legislation has this for its avowed object, it rests on a perfectly firm foundation.

Now, penalties inflicted on crime may protect the community in several ways. 1. By fear of suffering, which prevents the commission of crime. 2. By the actual restraint of the criminal, which disables him from committing crime. 3. By the education of the conscience through the act of public justice. 4. By the reform of the criminal. We will consider them in order.

VII. Criminal law in its early stages lays most stress on terrific punishments. Its laws are written in blood. The death-penalty is applied to numerous crimes. The prisons are places of torture, and any attempt to alleviate the sufferings of the prisoner is regarded as rose-water sentimentalism. Wright, in his "*Homes of Other Days*," describes the English prisons after the Norman conquest thus: "Imprisonment, even before trial, was made frightfully cruel; the dungeons were filthy holes, in which loathsome reptiles were bred, and the prisoners were insufficiently fed, and sometimes stripped naked." In the middle ages, he adds: "The gallows and the wheel were so commonly used as to be continually before people's eyes. Every town, every abbey, and almost every manorial lord had the right of hanging, and a gallows or tree, with a man hanging on it, was so frequent as to be almost considered a part of every landscape."

But as society advances these punishments appear shocking to the community, and it is found that severity in punishment leads to impunity. When punishments are more severe than the public sentiment approves, they are not inflicted, and the criminal escapes all punishment. One of the accepted maxims, therefore, of modern criminal jurisprudence is, "Crime is not prevented by the severity but by the certainty of punishment."

VIII. When criminals are in prison they cannot commit crime, and the community is thus protected by any kind of incarceration; but most terms of imprisonment are too short to do much good in this way. Short imprisonments also interfere with the reformation of the prisoner. He is thinking more of getting out than of reform; he has no time in prison to break up bad habits, or form good ones; he has no time to learn a trade, or to get any education, and so he usually goes out as bad as he came in, and is prepared to begin immediately a new career of crime. The protection of the community, therefore, seems to require that instead of short terms there should be substituted a sentence of indefinite confinement, the termination of which should depend on the behavior of the prisoner. An ignorant prisoner might be sentenced until he should have mastered a trade and acquired the rudiments of education. Fixed terms of imprisonment of different duration have probably come from the notion that the chief end of penalty is to punish guilt. Such a crime, it is thought, deserves ten years' imprisonment; such another merits only five; another only six months, &c. But if the purpose of imprisoning criminals is to protect society, they ought not to be set free until they have formed such new habits as will make it probable that they will lead honest and industrious lives.

IX. It is no doubt true that a public trial and conviction, if conducted properly, tends to educate the general conscience. But this result depends on the public belief that the innocent man will be generally acquitted and the guilty condemned. Justice becomes a farce when great

criminals, known of all men to be guilty, can readily escape punishment by the help of able lawyers, skillful bribery, absurd forms of law or iniquitous judges. Hence criminal legislation should aim at embodying the results of the largest experience and wisest study, and hence, also, the pardoning power of the executive should be limited.

X. Society is protected by the reform of the criminal. It is only on this ground that we can properly advocate such measures as will lead to this result. But it is evident that, if no criminal is allowed to leave prison except when he has become an honest man, the most fruitful source of crime would be stopped up. If a man come from prison unreformed, he comes out hardened, and becomes the most daring leader in outrages on the public peace.

Now the opportunities of reforming a criminal while in prison are very great if they are rightly used. He is absolutely separated from temptation, from evil companions, and bad influences. He is placed in a comparative solitude, where, if ever, he must reflect on himself and his conduct. We have the power of shutting out all bad influences, and letting all good ones in. We can give him the industrial education and intellectual education in which the majority of criminals are deficient. And finally, when he leaves the prison, he comes out ready to pursue some honest trade, and to commence a new mode of life.

XI. All these ends are attained by what is commonly called the "Irish system." Under this plan a prisoner is sentenced for an indefinite period, the duration of which he can greatly determine by his own good conduct. There are graded prisons, rising from those where there are the least liberty and the greatest hardship, to those in which are the most liberty and the least hardship. The prisoner, as his conduct is good, is gradually transferred from the lower to the higher prison, and thus is under the influence of hope no less than that of fear. He cannot leave the prison regularly, except by graduating from the highest class, and so coming out as a man proved to be a reformed man, not by plausible speeches, but by a long course of good behavior. Leaving the prison thus, known to be a reformed man, he has no difficulty in finding employment, and the taint of the prison does not adhere to him, to interfere with his attempts at earning an honest living. He finds work easily, and starts with a good standing in society.

XII. Therefore, if we consider the protection of society as the final cause of prison legislation, we are led directly to this system of "Irish prisons," as best accomplishing the end. Of course we include in this term all the methods which belong to this general plan. We advocate the reform of the prisoner, not in the interest of philanthropy or religion, but in that of society. We reform the prisoner in order to protect society. We abolish cruel punishments in order to protect society. We introduce hope into the prison to protect society. And in doing this, there is no danger that the prison will become too attractive; for this plan does not diminish restraint, but rather increases it; and with this plan naturally belong more certainty of conviction, less hope of pardon, and no prospect of leaving the prison except by genuine and demonstrated repentance and reformation.

11. THOUGHTS ON PRISON TREATMENT:

*By Alfred H. Love.*PHILADELPHIA, *Firstmonth* 20, 1873.*To the National Prison Association of the United States in convention at Baltimore:*

RESPECTED FRIENDS: I rejoice that you are holding a convention for the consideration of the highly important subjects connected with prison discipline. I thank you for your invitation, and regret that my engagements are such as to prevent my accepting.

For fifteen years I have been a visitor of our Eastern penitentiary, and am satisfied that kind and humane treatment of prisoners is the best.

Treat crime as a disease and the criminal as a patient. Hence, room, light, air, and judicious labor. Banish the idea of mere punishment and a machinery system of treatment. Study dispositions and graduate the penalties and premiums.

Start with the idea that those in prison are not the only criminals, the difference between detected and undetected criminality being very slight. Appeal to the manhood and womanhood of your prisoners, and do nothing to break the spirit of self-respect. Place first the reformation of the criminal; secondly, protection of the community; and, thirdly, opportunity for restitution for the wrong committed. Abolish all time sentences. As we would prescribe for a sick person until he was restored, and cease giving medicine to one who has recovered, so should we release the prisoner when reformed and safe to go abroad, and withhold discharge when not cured and when unsafe to be out. As it is now, the unreformed can claim discharge when the time has expired, and they are almost certain to return to their criminal pursuits; while, on the other hand, the law holds the penitent and reformed long after they may be worthy of another trial.

If it is objected and you say that this will cause hypocrisy, I reply, if the prisoner should be discharged after a committee had watched and tested his conduct, under the plea of reformation, it will be an evidence that it *pays to be good*, and if he go on all his life pretending to be good, the community will be safe and his pretense become a reality.

May you feel drawn to devote some time to the very important work *preceding prison life*. It is not enough to care for the prisoner while in prison, nor, indeed, after his discharge; we must have a constant care to prevent prisoners being made. Take care of the erring before the error leads to prison.

With my kindest regards, yours, cordially,

ALFRED H. LOVE.

12. A NOBLE TESTIMONY.

*Letter from Rev. C. C. Foote.*DETROIT, *January* 11, 1873.

MY DEAR FRIEND AND BROTHER: I am in receipt of your invitation to attend the Prison Reform Congress at Baltimore, for which I thank you.

What a glorious congress we had at Cincinnati. May yours at Baltimore excel it in glory. How happy should I be to be with you. But my labors for this world are apparently finished. For the past nine months I have been a helpless invalid. I put my very life's blood into my four years' chaplaincy in the Detroit house of correction. Blessed years of precious fruit and fatal toil! The field was so constantly whitened for the harvest that it seemed impossible to avoid over-labor. I know of no place so hopeful for winning men and women back to the knowledge and service of God as a properly conducted prison.

May Heaven hasten the day when the *radical reformation* of unfortunate criminals shall be the first and highest aim of our prisons, rather than the saving to the community of a few paltry dollars. "This," said the great Teacher, "ought ye to have done, and not to leave the other undone."

With high esteem and true affection, yours, &c.,

C. C. FOOTE.

Rev. E. C. WINES, D. D.

IV.—REPORTS ON THE PENAL, REFORMATORY, AND PREVENTIVE INSTITUTIONS OF STATES AND TERRITORIES.

1. CALIFORNIA.

By Rev. James Woodworth, corresponding secretary of the California Prison Commission.

The extreme length of the State of California is about eight hundred miles, and the width from one hundred and fifty to two hundred and forty miles, with a coast of nearly one thousand miles. The number of inhabitants is probably over 600,000. Though young in years, with a small population in proportion to its size, yet having a water-front, with so vast an extent of country lying back of it, and looking out, through the Golden Gate, directly across the sea, to Japan, China, India, and Australia, with its fertile soil, its wondrous climate, and its inexhaustible stores of mineral wealth, California is destined, at no distant day, to equal in importance, commercially and otherwise, the most favored States of the American Union. This importance will extend to social and moral, as well as material, interests.

Such being the position and prospective power of California, her influence will extend over the whole of what is known as the Pacific coast, embracing nearly all the country lying west of the Rocky Mountains. Of this entire territory, California must take the lead. The character of her institutions, including those which look to the prevention and repression of crime, must, to a great extent, impress itself upon the institutions of her neighbors. This is already becoming apparent; unpleasantly so, too, for while endeavoring to pattern after us, a want of due discrimination causes them to copy our defects as well as our excellencies.

This State was at first little more than the mere camping-ground of adventurers, who had come here only for a temporary sojourn. The consequence was that almost everything was temporary in its character, being designed merely to meet the needs of the actual present, with little thought or regard to what should be afterwards. In hardly anything was this more apparent than in the provisions for punishing crime, so that before any regular system had been thought of, the plan adopted had become so expanded that it was difficult to change it.

Nevertheless, important reforms have already been inaugurated. Our criminal laws and judicial system have been greatly improved. Our penal and civil codes, the result of four years' labor by a commission appointed to prepare them, have already received high praise from jurists fully competent to form a judgment of their merits.

Our penal institutions are a state prison, a jail in each of the fifty counties into which the State is divided, a city prison and jail in San Francisco, and station-houses or lock-ups in the principal cities. There is no central or general authority, charged with the administration of our entire prison system. The state prison, the most important of our penal establishments, is managed by a board of directors, consisting of the governor, the lieutenant-governor, and the secretary of state, all constituted directors by their office. The board has no official connection with any other penal or reformatory institution in the State. The members are all elected at the same time for four years; and, as a matter of course, their terms of office expire together. Each receives as state-prison director \$75 per month. The law gives the directors full power to create and fill offices, to fix the salaries of officers, to remove them at pleasure, to let the labor of the convicts to contractors, and, in short, to do whatever they may think necessary or expedient for the good of the institution. These powers are not suffered to rust for want of use. They are exercised to the fullest extent, so that an entire change of the prison staff follows every change in the political complexion of the board.

Though the lieutenant-governor is not made *ex-officio* warden by the statute, yet, as no salary is attached to the office to which he is elected, and as his duties as president of the senate occupy but a fraction of his time, the custom of making him warden, or "resident director," has become a settled one; so that an election to one office is virtually an election to the other. This the law indirectly contemplates by providing that he shall be "paid the sum of ten dollars per day for each day's services rendered for the performance of any duty at the state prison."

In the early history of the State the convicts were, for a short time, kept in a hulk known as the "prison brig." As the number increased and additional accommodations were needed, a prison building was erected. The security of the convicts being at that time considered the main thing, the prison was built between two ranges of hills, affording excellent facilities for guarding the inmates by means of cannon planted upon them, which swept the entire grounds. The only disadvantage of this locality is that it prevents any extension in the direction of the hills, and compels every enlargement to be made on a line parallel to them. With this exception, a more desirable site could hardly have been selected. The prison originally consisted of one stone building, 180 feet long by 28 wide, and one story high. It is said to have contained at first but one room, into which were crowded three hundred prisoners. It has since been divided into rooms and another story added. Other cell-buildings, workshops, offices, &c., have been constructed from time to time, but so irregularly that the additions have made it a mass of patch-work.

The prison is situated at Point San Quentin, twelve miles north of San Francisco, on an indentation of the bay of that name, and within three miles of the popular watering-place of San Rafael. The location is both healthy and beautiful. It is surrounded by some of the finest scenery of the coast, forming a panorama of rare magnificence, the value of which, in its elevating and refining influences even upon men who are imprisoned as felons, can hardly be exaggerated. The prison premises embrace about one hundred and thirty acres, most of the land, how-

ever, being of little value except for grazing. The prison grounds proper are surrounded by a wall 25 feet high, forming an inclosure of some six acres. Within this inclosure, besides a great number of other structures, there are three prison buildings, one of which has common dormitories. The other two have an aggregate of four hundred and twenty cells, each 9 feet long, 4 feet wide, and 8 feet high, designed as the dormitory of a single prisoner, but often receiving two. Each cell is supplied with a bunk, a straw bed, two blankets, a night bucket, and such other articles of convenience or luxury as the taste of the occupant may suggest and his ability enable him to buy.

On the hills flanking the prison are immense reservoirs, one of which, now in process of construction, will, when completed, hold 250,000 gallons. Through it the prison will be supplied with pure mountain-water by an incorporated company.

The prison staff consists of sixty-three persons, and their salaries aggregate \$50,340 per annum, over and above the supply of the warden's table and the board of the other officers, making together more than one-third of the entire yearly cost of the establishment.

The industries carried on are the manufacture of furniture, saddles, harness, wagons, and boots and shoes; to which is added, in summer, brick-making. These give employment to about five hundred and forty men, whose labor is let to contractors at 40 cents a day. The average number of prisoners is about 900, two per cent. of whom are women. The chapel will seat five hundred persons. It has a handsome pulpit and sofa, and an excellent cabinet organ, all purchased with money contributed by the prisoners. The organ is played by one of themselves. There is no regular chaplain, and never has been. Public worship, however, is held every Sunday, conducted by ministers of different denominations from San Francisco, who volunteer their services. All the prisoners are permitted, though none compelled, to attend. About three hundred are usually present. The prison choir is composed of convicts, who perform well that part of the service.

After divine service the prison school is convened, in which one hundred and fifty to two hundred prisoners are instructed in the elementary branches of an English education by some of the better educated of their own number. During the first eighteen months of the existence of the school one hundred and eighty prisoners were taught to read and write, and though many of them had been discharged, not one had come back to prison. When the school closes, some twenty of the prisoners, who profess to be striving to serve the Lord, meet for prayer and conference, and an hour is spent in those exercises.

The prison library contains about 3,000 volumes, and is well patronized, 1,600 books being taken out every month. Occasionally the prisoners have an entertainment of their own, which consists of readings, recitations, and compositions prepared by themselves. Once in a while, also, a familiar lecture is delivered to them by some person invited to that service, professors in the State University sometimes visiting the prison for this purpose.

Formerly the principal means of discipline was the lash. This is now not often used. The punishments at present employed are loss of time gained under the commutation law, the dark cell, a reduced diet, and the shower-bath applied by means of a hose and nozzle. The commutation law allows the convict a credit of five days for every month of good behavior for the first two years, and an additional day during each succeeding two years up to ten, after which he gains ten days per month. This law has worked admirably, and has very much reduced the neces-

sity for actual punishment. Aside from this, no rewards are given for good conduct.

Every convict, if without clothing of his own, is supplied, on his discharge, with a suit by the State, consisting of a coarse shirt, a pair of pants, a woolen jacket, a pair of brogans, and a cheap hat; and, in addition, \$5 in money are given to him.

The prisoners' food, though plain, is of good quality and in abundant quantity. On Thanksgiving and Christmas a sumptuous dinner is served to them, which is usually provided by the benevolent citizens of San Francisco through a committee of the California prison commission.

The sanitary state of the prison is good. Only eight deaths occurred last year, being a little less than one per cent.

The expenses of the prison for the past year have been \$166,790, and the earnings \$67,650, leaving a deficiency of \$99,140.

The fees allowed the sheriffs for the transportation of prisoners after conviction are 50 cents per mile for a single prisoner, and 25 cents for each additional prisoner. It thus costs, to get a convict to the prison from some of the more remote counties, \$260. The entire cost of transportation for the twenty-second fiscal year of the prison was \$19,997.50, or about \$72 per prisoner.

The governing authorities of the county jails are the boards of county supervisors, but the sheriffs of the counties, elected for two years, are in immediate charge. These appoint their deputies, so that change is as much the order of the day here as in the state prison.

The prison accommodations of San Francisco are not sufficient for its needs. The city has two prisons—a police prison and a city jail. The police prison is in the basement of the city hall. It is damp, dark, ill-ventilated, and greatly overcrowded. The city jail is a substantial and handsome building, but quite too contracted in dimensions for present necessities. Sixteen Chinamen have been confined in a cell 10 feet by 8, with a ceiling only 8 feet high. The necessity for such cruel overcrowding has been, in some degree, obviated by the erection of a small additional building in the yard of the jail. A house of correction has been resolved upon, which, when built and in operation, will afford all the relief required for the present.

There can be no doubt that our prisons themselves are schools of crime. Many are made confirmed criminals by being sent there, who, in all probability, would not become such if, while undergoing their punishment, they could escape the moral contagion with which these places abound.

There is but one reformatory for juveniles in the State. This bears the name of industrial school, and is situated in the immediate neighborhood of San Francisco. The average number of inmates is two hundred and fifty, all boys. The school has a farm of one hundred acres, which gives employment to quite a number of the children. Others are engaged in shoe-making, tailoring, and household duties. A good many are too young to labor. The forenoon is devoted to work, the afternoon to study, and the evening to music, vocal and instrumental. There is a band composed of thirty boys, one of their number acting as leader. The punishments are severe whipping with a cowhide or leather strap, standing in a stooping posture on a wooden box or iron safe, dark cell, &c. Escapes are frequent. Recently thirteen got away within a fortnight. The history of the institution for some years past has been deplorable; but details would scarcely be to edification.

Of preventive measures in operation among us I place first the earnest, prayerful efforts of Christian men and women; and chief of all the

influence of wise and godly parents. Next are the preaching of the word, the Sunday-school, and other agencies for giving effect to the gospel. Closely following these are public and private schools. Our orphan asylums, where the lack of parental culture is, to a great extent, supplied, are greatly preventive of crime. So is the Ladies' Protective and Relief Society, with its "home," in which one hundred and seventy-three children, though not orphans, are cared for and educated. Temperance societies, young men's Christian associations, and the various other benevolent agencies with which our State, and particularly the city of San Francisco, abound, are all doing their part in this great preventive work.

Little or nothing is done for the aid of discharged prisoners, except by the California prison commission, an institution organized in 1865, with this as its primary object. Its office is in San Francisco. The general agent gives his whole time to the work. He visits regularly the city prison and county jail here, and the state prison at San Quentin. This he does, not only to converse with and counsel their inmates, but also to learn their purposes and necessities, so as to be better prepared to deal with them when, on their release, they call upon him at his office. Having myself occupied the position for nearly five years, and having been ever since familiar with the operations of the association, I am prepared to speak in emphatic terms of the success of the agent's efforts. The number of discharged prisoners variously aided by him during the past year was 462; the number of prisoners aided with legal counsel, 116; aided by mitigation of punishment, 70; discharged through his interposition, 46; aided with board and lodging, 101; helped with small sums of money, 198; supplied with clothing, 8; furnished with means to leave the city, 141. The whole number of prisoners conversed with, counseled, and in some way aided, materially or morally, was 1,387; whole number of interviews had with these, 2,827.

2. CONNECTICUT.

By Rev. J. K. Fessenden, secretary of the Connecticut Industrial School for Girls.

I. *Preventive institutions.*—By these are meant institutions designed exclusively for children under eight years of age, who, by the death, abandonment, incompetency, or vices of their parents, are thrown upon society, but in no proper sense to be regarded as criminals. Of these there are four Protestant orphan asylums, open to children of every nationality and faith. The first was established by ladies at New Haven in 1833. Commencing without funds and in a very humble way, its assets now amount to \$36,500, with several large legacies in prospect. There are now one hundred and twenty-six inmates, more than one-half of whom are of American parentage.

Next to this a similar institution was established at Hartford, which has about the same number of inmates, and is already the recipient of large donations and legacies.

Third in order is the Bridgeport asylum, which is of recent origin. It was designed especially for the children rescued from the city almshouse.

The fourth is a small family-home for poor children. This was started by, and is under the control of, a benevolent lady in Danbury.

All these institutions are private charities, under the management of boards of women, and are accomplishing a great amount of good.

There are two Roman Catholic orphan asylums, designed exclusively for the children of Catholics. They are at New Haven and Hartford. Respecting them, I have been able to obtain no definite information.

During the late civil war much interest was excited in behalf of the children of soldiers killed in the service of our country. An association was formed for their care, to which was given a home at Mansfield. Its noble-hearted and Christian donor devoted himself to its superintendence during his brief life, with the sole reserve of a bare maintenance. The school was opened in 1866, and up to 1st of June, 1871, had received one hundred and thirty-two children, of whom sixty-eight were admitted during the past year. It is supported largely by the contributions of the common and Sabbath-schools of the State, aided by donations from other friends, and by an appropriation of \$1.50 per week for each inmate.

A similar, though smaller institution, was established at Darien by the liberality of a wealthy gentleman, who has largely contributed in various ways to its support.

Of late there have been several other charitable institutions started at Hartford and New Haven, which cannot fail to be preventives of crime. I refer to associations for the aid of the poor, under the care of the city missionaries, and also to reading and refreshment rooms for news-boys and laboring men. There has also been established at Hartford a boarding-house for respectable young women, where they can find homes at a moderate cost and enjoy the associations and benefits of a respectable and virtuous home.

II. *Reformatory institutions.*—These are the State Reform School for Boys, at West Meriden; the Connecticut Industrial School for Girls, at Middletown; and the Home for the Friendless, at New Haven.

The State Reform School for boys was established in 1854. It is a State institution, created, owned, and, through a board of eight trustees, controlled by the State. It has a valuable, well-watered farm of one hundred and sixty-three acres, which has become one of the model farms of the State. The institution has ample accommodations for three hundred boys, with model dormitories, school-rooms, workshops, chapel, offices, and all the modern appliances for the proper care and discipline of the inmates.

The barn and other out-buildings are substantial and convenient, and the stock of the farm very choice and valuable.

The system on which the institution is conducted is that known as the congregate, in distinction from the family plan. It is so administered as to be pervaded by a spirit of wisdom and kindness—by the mingling of authority with constant appeals to the intelligence, the best convictions, and the noblest aspirations of the boys who are gathered under its care; every day the family of the superintendent and the boys unite in morning and evening devotions, accompanied with the inspiring singing of hymns and with such advice as its gifted superintendent thinks proper to impart. God's providence and goodness are recognized in the convocations for morning and evening prayer, and at each successive meal. For several hours every one daily attends one of these graded schools of the establishment, under the general care of the assistant superintendent, who from the beginning has managed this department with conscientious devotion and consummate ability, and who has all the assistance needed in his work. Several hours are each day devoted to labor on the farm or in the

workshop, under the direction of skillful overseers, and with all the necessary stimulants to skill and industry. The food and clothing are, both in quantity and quality, all that health and comfort require; cleanliness is exacted, and order and unhesitating submission to authority enforced by special religious services on the Sabbath, and by a constant reference at other times to the laws and claims of God.

More than eighteen hundred boys have been connected with this school during the nineteen years of its existence. The limit of their age is from eight to sixteen. Originally none could be sent to the school who were not convicted by the justices of the peace or some criminal court of an offense punishable by law. But since 1869 many have been committed under the truant law.

The results—financial, moral, and social—of this school are believed to be as favorable as those of any other institution of the kind in the United States. The superintendent believes that three-fourths of the boys become as respectable, virtuous, and useful men as the average of the common classes of society.

The counterpart of the boys' reform school is the Connecticut Industrial School for Girls. This is in the beautiful town of Middletown, on a finely situated farm of forty-five acres, a mile and a half from the center of the city. This site was the generous gift of the town, at a cost of \$11,500.

Unlike the boys' school, this institution is a private charity, incorporated by the State and employed by it to take charge of the viciously-inclined young girls who may be sent there. For this service the State stipulates to pay \$3 per week for each girl thus sent. Unlike the boys' school, too, this is organized upon the family plan, with houses having accommodations each for thirty girls.

The school has been in operation three years, and has received one hundred and sixteen inmates, of whom eighty-one still remain. The distinctive features of this school may be thus concisely stated:

1. Its name is the *industrial*, not the *reform*, school for girls.
2. Its *proper* subjects are *viciously-inclined girls*, between the ages of eight and sixteen years. They are not simply orphans, or the neglected and foundling, nor yet are they those who, as a class, have fully entered upon a course of vice and crime. They are rather neglected and abandoned children, thrown out, from whatever cause, upon the wide world, friendless, ignorant, and under the depraving and debasing influences of abject poverty and vicious associations. Sixty per cent. of them are wholly or in part orphans. More than 75 per cent. are the children of drunkards and criminals—of abandonment and prostitution. Most of them were paupers, beggars, vagrants, petty thieves, and too many of them have already been drawn into the society, if not the practice, of lewdness.
3. They are regarded and treated by the law of the State, not as criminals to be convicted and punished, but as ignorant and exposed children—as sinned against rather than as sinners, and as such to be pitied and educated. The State stands in the place of a common parent, and, as such, cares for them where their parents or other natural guardians are dead, or are incompetent or unwilling properly to train and educate them. Upon due evidence of this fact, the State intrusts these children to the care and guardianship of the directors of the industrial school till they are eighteen years of age, with the power to restore them to their natural parents, to bind them out, or to intrust them to adopting parents, or suitable guardians.
4. At the school the aim is to bring the girl at once under the nearest

possible approach to the influences of a well-regulated Christian family, with its household worship, sweet songs, its motherly watchfulness, and its pious counsels and steady and gentle but firmly authoritative and constant training. All in turn are taught the duties of the household—to wash, to iron, to cook, to sew, and to give to everything a look of tidiness.

5. Careful attention is given to scholastic and religious culture and thrift and training; but it would occupy too much space to go into detail upon these points.

6. A residence at the school is not to be too long protracted—not longer than is needed to fit the girl for a useful residence in a private family, and the almost equally difficult task of finding a family that will be willing to take a friendless and often froward girl, and seek as earnestly to complete the good work begun as to obtain her labor at the lowest possible cost.

7. It is designed to leave the door wide open at all times for the girl's return to the school if, for any cause, such a return is thought best, and to follow those who have gone from it until there is reason to believe that they are beyond the need of its guardian care.

There is promise of the best results, but it is too soon to speak with confidence on this point.

There is a third reformatory institution, viz, the Home for the Friendless, at New Haven. This is designed for friendless, outcast, and neglected women of every age and condition. The Industrial School could not receive those who were far advanced in a life of crime. Hence Christian women sought to provide for all such a refuge whenever they were disposed to turn from their evil courses. Here, they say in one of their reports, "from the hospital the convalescent, from the jail the culprit, from the alms-house the friendless, find a gateway through which they can enter the higher and purer paths to virtue and independence." For this purpose they have purchased and fitted up a comfortable dwelling a few miles from the city. It is under the care of a board of ladies who superintend all its concerns. The charity of the benevolent has thus far abundantly supplied them with the funds needed for their work, and in many cases they have had the joy of knowing that their work of love has not been in vain.

III. *Penal institutions.*—Of these there are three classes, the town work-house or house of correction, the county jail, and the state prison.

The several towns have power to establish work-houses or houses of correction, to erect and provide suitable buildings, with cells or apartments for the confinement of offenders sentenced thereto, and to compel the labor of the inmates. These are under the care of the selectmen, who appoint the keeper and regulate his pay. It is a sad fact that in these town-houses are frequently found, indiscriminately mingled, the virtuous and friendless poor, the demented, the imbecile, and the miserable tramps, vagrants, and drunkards, who infest the streets, and steal their living so long as they are able, and then perhaps apply to the town-officers for a brief shelter. With these, too, are found the refuse of the towns and cities, sentenced there, time after time, for sixty days, for drunkenness, prostitution, and petty thefts. This class of institutions are a disgrace to the State, and will continue to be so, until their true character and their enormity shall be brought to light by a careful official investigation, and remedied by the strong arm of State authority.

The second class of penal institutions is the county jails. Of these there are eleven, or one for each of the county towns. As their names

indicate, they are county institutions, built, owned, and managed exclusively by the counties. The result of this is a great want of uniformity in their construction and management, and as great a difference in their general character. They are used only as places for the detention of persons committed for trial or convicted of minor offenses.

Full returns are made yearly through the county commissioners to the secretary of state of the number, color, sex, age, and nativity of the prisoners, as also of their social condition, habits, education, causes of commitment, method of discharge, and of the receipts and expenditures of each jail, an abstract of which is submitted to the legislature. From this we learn that there were committed to the jails during 1871 two thousand seven hundred and forty-five persons. The average number confined was three hundred and thirty. Of these, five-sixths were males, thirteen-fifteenths of foreign birth, more than half were committed for drunkenness, and only one hundred and forty-seven were strictly temperate. In most cases there is no other separation of the prisoners than that of the sexes. There is no provision made by law for their secular instruction, and but little if any given. The jail in New Haven is of modern construction, and is the only one in the State which is in any respect what it ought to be. In Fairfield and Hartford Counties new buildings are in process of erection on the most approved models.

The character and influence of our jails is thus sketched by the special commission on the state prison in their report to the legislature of 1872:

Many of our jails and houses of detention for the idle and vicious hold about the same relation to the state prison that the common schools do to the colleges. We cannot now enter into the sanitary condition of our jails and work-houses, though we are certain that it is bad enough in most of them. But we call your attention to them as nurseries of crime with regard to the state prison. In the poor-houses the innocent poor are brought into contact with the abandoned and profligate; and those who have only slightly and for the first time, perhaps, departed from the way of decency, associate with those skilled in crime and hardened in shame. In the jails those committed for trial, charged with a first offense and presumed by the law to be innocent till proved guilty, and those young in sin, have opportunities of association with the vilest and most abandoned criminals, and the result in both cases is deplorable. The minor jails are not simply *feeders* of the penal prisons, but they offer *uncommon facilities* for the production of criminals. There are jails in this State which are as wisely and humanely managed as is possible under our prison system, or rather our want of system. But we are convinced that the jails and poor-houses of this State need a thorough examination, and that it is time that we had a comprehensive system for all such institutions.

3. *The State prison.*—From 1773 to 1827, the State prisoners of Connecticut were immured 60 feet under ground in an abandoned copper mine at Simsbury. The prison was known as the Newgate of Connecticut. The history of that long period is one of the saddest proofs of the barbarities then practised by Christian States upon the criminal classes.

In 1826 the present state prison at Wethersfield was built, and in 1827 was placed under the superintendency of Moses Pilsbury, with the assistance of his son Amos Pilsbury, now of Albany. The latter succeeded his father as superintendent in 1830, and remained in that position for fifteen years. There is scarcely to be found in the history of state-prison management a brighter record than that of these years under these remarkable men. The Connecticut state prison became the model institution of the United States, and was assigned the first place in the report to the French government of the distinguished French commissioners on prisons, de Tocqueville and de Beaumont, in 1830.

This pre-eminence, however, has long since passed away. A new order of things in respect to prison discipline has dawned upon the world, and

has greatly modified the systems and management of other States, while in Connecticut they have remained essentially the same.

The very able report of the commissioners of 1872, which has been already cited, makes the following statements:

The commissioners entered on their work in the belief that the present prison might be so repaired and modified as to suit modern ideas, but they were brought to the decided conclusion that the State needs a new prison on a more favorable site, and constructed on an entirely different principle and scale. Among the reasons given for this conclusion are the dilapidated condition and utter inadequacy of the present buildings; that there are no suitable accommodations for the officers; that there is no suitable drainage of the premises; that the cells are too small and admit of no ventilation, and many of them damp and unwholesome; that a proper separation of the sexes even is now impossible, and, indeed, cannot be secured in the same prison. While they would retain the present silent system, they would greatly modify it. They recommend the construction of a new prison which shall admit of a proper grading of the prisoners, the discontinuance of the parti-colored prison-dress, the cropping of the hair, and, indeed, everything which disregards the manhood of the prisoner and extinguishes hope. They would treat him as a man and a brother, though erring and fallen and degraded.

The industries pursued are shoe-making, the manufacture of carpenters' rules, and the burnishing of silver ware. The gross earnings of the last year were \$26,399, and the ordinary expenses were \$23,187, leaving a balance in favor of the State of \$3,212.

Religious and educational agencies are employed to a limited extent in the discipline of the prison. A chaplain is employed, who conducts religious services daily and also upon the Sabbath, in which he reports most of the prisoners manifesting a commendable interest. A Sunday-school is held every Sabbath afternoon, and the men are visited during the week by the chaplain in their cells. Much interest was awakened last year by addresses on temperance, made by members of the Good Samaritan Association, of Hartford. Secular instruction is given in the evening to a few prisoners in their cells.

The commissioners recommend that the new prison shall have every needed facility for the mental and religious instruction of its inmates.

Prisoners have the power of shortening their terms of sentence by good conduct, a measure which has shown itself useful both in a disciplinary and reformatory point of view. No provision for discharged convicts is made beyond that of giving them a suit of clothes and \$10 in money on their liberation. Reform is urgently needed in this direction, either through legislation or private benevolence.

3. ILLINOIS.

By Rev. Fred. H. Wines, secretary of the Board of State Commissioners of Public Charities.

The prison system of Illinois may be said, as in all the Western States, to be still in its infancy; and although a new State has one great advantage over those which are older in the opportunity thus afforded of profiting by the experience of those who have trodden the path before us, we cannot in Illinois boast of having improved our opportunity, in so far as relates to the laws and usages of prisons. The reason probably is found in the existence of an almost universal apathy and indifference upon the subject. The reformation of criminals is regarded as a hopeless undertaking. The substitution of district prisons for county jails is resisted by those who depend in part for their income upon the profits

of jail-keeping. The result is, that any intelligent, systematic effort at the introduction of labor into prisons designed for criminals of the lower grade, or at intellectual or moral culture of criminals of this class, is at present impossible. In presenting the following brief sketch of the prisons of the State, therefore, my only object is to state what is, not to depict what should be. For the realization of the desired reform in our prison system we may be compelled to wait many years, until persistent agitation and the advance of popular intelligence have accomplished their work. Reform, at some time, is certain.

The county jails.

There are, in this State, one hundred and two counties. In nearly all of them, at the county-seat, there is a jail, varying in size from a single cell to fifty, and in cost from \$1,000 to \$90,000. A dozen of our jails, at least, have cost over \$20,000 each. Nearly one-fourth of the whole number probably are substantially and handsomely built, commonly of stone, and are furnished more or less fully with approved appliances for heating, ventilation, sewerage, and bathing. Of the remainder, some are under-ground dungeons in the basements of court-houses or of sheriffs' residences; some are old-fashioned block-houses, sheathed on the inside with iron; some are iron cages, set like safes for moneys and valuable papers, in the entry or in the upper story of the jailer's house; some are virtually privies, placed over open vaults, whose noxious gases circulate through the cells and corridors above without let or hinderance. Most of them are very small, and it is a pleasure to be able to add that many of them are nearly always empty. The number of prisoners in confinement at any one time in Illinois is never large, if we except the convicts in the penitentiary.

The following extract from the (unpublished) report of the board of charities will furnish a somewhat fuller account of the jails of this State:

Our deliberate judgment is, that the practical value of jails, whether as means of prevention or of cure of crime, compared with their great cost, is very trifling. We find, upon inquiry, that others have arrived at the same conclusion before us. In fact, this opinion is shared by nearly all who have given the subject any attention. Probably no other equal expenditure of public money is equally unprofitable.

In the first place, the county jails of Illinois, as of other States, are for the most part badly planned, if not badly built. Some of them are very unsafe; and but for the vigilance of the jailers in charge, escapes would be an every-day occurrence. They are unsafe, either through the weakness of some particular portion of the structure; or on account of the facility of communication in them, among the prisoners, and even, in many instances, with the outside community; or because they afford no adequate protection to the turnkey against sudden assault.

Others are as secure as any jail can be made, but are wholly deficient in the essential conditions of life and health. They have ordinarily no sewerage; they are illy ventilated, or not ventilated at all; they are very imperfectly lighted; some of them are destitute of any means of warming the air in winter, and scarcely any of them have proper provision for bathing by the prisoners.

A jail may be safe and comfortable, and yet be so constructed as to render the classification of prisoners impossible. There is not a jail in the State in which the accused are separated from the sentenced. Witnesses are often, but not always, confined in a separate apartment, known as the "debtors' prison." In some of the jails there is no means of separating the sexes; in others, the only separation is by cells, opening into a common corridor; in others, female prisoners are confined in the debtors' prison; in others, a female department has been extemporized in the sheriff's private residence, by sheathing an ordinary window with sheet iron; in a few, the female prison is properly planned and built. The number of witnesses and women, however, in confinement in this State, at any one time, is very small.

As to the internal management and discipline, generally, there is not much occasion for complaint. We are satisfied that where food is so abundant and cheap, the temp-

tation to stint prisoners in their diet is wanting; and in many counties they are fed from the jailer's own table; many counties even furnishing clothing, in extreme cases, at public expense. The jails are not always as neatly kept as they might be, and personal cleanliness on the part of the inmates is not sufficiently insisted upon. In some cases, a little more care to provide reading matter would be commendable. But in all our experience, we have found no evidence or intimation of personal cruelty to prisoners.

There are two particulars, and these of paramount importance, in which the very best jails in the State are as objectionable as the worst. We refer (1) to the hourly intercourse of prisoners with each other, and (2) to their lack of any useful, honorable employment. It is this *association in idleness*, which is the curse and condemnation of our present jail system.

Confinement in separate cells is a partial but very imperfect barrier to association; because communication between the cells is not impossible, and communication in the corridors is generally allowed, to a certain extent. It is also customary to place from two to six prisoners, when necessary, in a single cell, on account of the want of sufficient room in the majority of jails.

The effect of association is to increase the number of criminals, and to develop their criminality. The innocent and the comparatively innocent are corrupted by the example, the conversation, and the direct teaching of more experienced transgressors. The lessons taught in county jails are, contempt for authority, human or divine; hostility to law and to its officers; the delights of vicious indulgence; the duty of revenge upon society for imaginary wrongs; the necessity of violence, of daring, and of sullen submission to punishment; the hopelessness of all effort at amendment; and the best methods of success in criminal undertakings. Past exploits are here recounted; future deeds of darkness are planned. The history and character of noted criminals and of well-known officials are discussed. Lewd songs and conversation, profanity and ribald jests, fill up the day. In many jails card-playing is freely allowed. In a few, liquor is not absolutely prohibited, provided that the prisoner ordering it is able to pay liberally for the indulgence. Every jail is a school of vice. More than one hundred of such schools are maintained in Illinois, at public expense; and the public furnishes an education in crime, at its own cost, annually, to hundreds of criminals, in this State alone. We admit the necessity for prisons; but are we not right in asking whether prisons of this particular class do not work as much harm as good to the community?

But the evils of promiscuous association are enhanced by the universal reign of idleness in county prisons. This idleness is compulsory; it is a necessity of the situation. The State appoints as the presiding *genius loci*, the mother of all villany, instead of labor, the mother of every virtue. No policy could be more shortsighted.

Idleness, in prison, is a premium upon crime. Multitudes of men commit larceny every autumn, simply to secure, free of cost to themselves, comfortable board and lodging, with agreeable company, through the winter months. They do not dread the confinement, and care nothing for the disgrace.

In enforcing idleness, the State voluntarily relinquishes the most effective means both of the punishment and of the prevention of crime. What makes men criminals? In nine cases out of ten, it is aversion to labor, and the conviction that a life of crime is easier and fuller of enjoyment than a life of industry. Make labor compulsory in all prisons, and the prison at once becomes a terror to evil-doers. Confinement at hard labor is to the majority of criminals the severest possible punishment. But the present system ignores this most obvious truth.

The physical and moral effect of protracted idleness upon individuals is deterioration. The muscles become flaccid, lymph accumulates, the nervous system loses its tone, the will is enfeebled, the moral nature is depraved; and at the expiration of his imprisonment, the offender goes forth, to recommence his criminal career, with his power to earn an honest livelihood and to resist temptation diminished instead of augmented.

These facts are well known to all county officials, and give rise to much lamentation on the part of all sensible men who have the cause of public virtue at all at heart. One of the worst effects of the present system is its influence upon circuit and county judges, in inducing them, against their own inclination, to sentence men for the shortest periods, when justice demands a maximum sentence, instead. But a judge inevitably thinks of the cost to the county of protracted imprisonment; he knows its futility; and he asks himself, what is the use? The consequence is, that crime is not adequately punished; transgressors are emboldened; crime increases; and too often an outraged community takes the administration of justice into its own hands. This is the origin of lynch law, that blot upon American civilization. Lynch law is nature's own remedy for weakness in the criminal administration of any government.

The penitentiary.

The Illinois State penitentiary, at Joliet, is one of the largest and most magnificent structures in the United States. It is constructed on

the plan of a center building with two wings, and the necessary shops are in the yard. The number of prisoners averages about twelve hundred and fifty, of whom, perhaps, twenty are women. The cellular system is followed, in the arrangements for eating and for sleeping, but the labor is on the congregate plan. Solitary confinement during the term of sentence is resorted to in the last extremity as a punishment for the incorrigible refractory. The branches of labor pursued are cigar-making, cooperage, the manufacture of shoes and harness, and also of butts, and stone-cutting. For stone-cutting and quarrying, the immense fields of stratified limestone, at Joliet, afford peculiar facilities. The new state-house now building at Springfield is constructed of this stone, and the cutting is done by the inmates of the penitentiary.

The average sentence of convicts at Joliet is about three years. Seventy criminals have been sentenced to imprisonment for life in Illinois during the past seventeen years; of whom seven died in prison, one was sent to the insane asylum, and twenty-three have been pardoned, after serving for a longer or shorter time, as shown in the following statement:

Three served 1 year; 2 served 2 years; 4 served 3 years; 2 served 4 years; 1 served 5 years; 6 served 6 years; 2 served 7 years; 2 served 8 years; 1 served 10 years—23 served, on an average, less than five years each.

Of the thirty-nine life convicts still in confinement, 2 have served 11 years; 1 has served 8 years; 2 have served 7 years; 5 have served 6 years; 6 have served 4 years; 7 have served 3 years; 6 have served 2 years; 3 have served 1 year; 7 have served less than one year—39 have served, on an average, about three and one-half years each.

About four-fifths of the commitments are for crimes against property, and one-fifth for crimes against the person. About one-fourth of those committed are foreigners. The ratio of foreign convicts to the foreign population of the State is no larger than that of native convicts to the native population, one-fourth of our entire population being foreign-born.

A library of three thousand volumes has been provided for the use of prisoners. A school, numbering two hundred or two hundred and fifty, has been organized, and a teacher employed. Religious services are held in the chapel on the Sabbath, and the chaplain visits the men nightly in their cells.

For many years this penitentiary was leased by the State to the highest and best bidder. A few years ago the system of leasing was abandoned, and the discipline and financial management on behalf of the State were placed in the hands of the warden, subject to the direction of a board of commissioners. On the 1st of December, 1870, the indebtedness of the institution was stated by the warden at \$332,832.18. The general assembly, after making an appropriation for the payment of the existing indebtedness, authorized the leasing of the *labor* of the inmates, retaining the general management and discipline in the hands of the prison officers, and the result is that during the past year, for the first time in its history, the penitentiary has earned \$35,000 or \$40,000 above the actual expenses.

The State reform school.

At Pontiac, on the Chicago and Saint Louis Railroad, a State reform school has been established, which was opened June 1, 1871. One hundred boys have been received as inmates since that date.

The reform school of Illinois differs from similar institutions in other States, in the light in which it is regarded by the supreme court, namely, as a *prison* for juvenile offenders. No boy can be received except under sentence of a court, nor can any boy be retained during his minority, but all must be discharged on the expiration of the sentence. All the inmates have been committed for high crimes, and for periods varying from one month to ten years. The average sentence is one year and nine months. Under the decision of our supreme court, the institution fails to meet the design of its originators and best friends; but the internal discipline is like that of a reform school, and the authorities are allowed to discharge boys on ticket-of-leave.

Discharged convicts.

No agency exists in this State for the aid of discharged convicts, nor is there any voluntary society to take the place of a State agency.

*Central oversight.**

Illinois has a "board of public charities," charged with the duty of annual visitation and inspection of all county jails and almshouses within her borders, but the commission has no authority or power beyond that of inspection and report.

4. INDIANA.

By Charles F. Coffin.

The State of Indiana was admitted into the Union in 1816. The population was then small, probably not exceeding 20,000. Most of its territory was thickly covered with trees, and the labor of clearing and rendering it habitable was great; hence its progress for several years was slow. Its inhabitants were mostly farmers, crime was rare, and punishment speedy and of a primitive character. By a statute of 1807, horse-stealing, treason, murder, and arson were punishable with death. Whipping might be inflicted for burglary, robbery, larceny, hog-stealing, and bigamy, also for striking a parent or master. Provision was made for confinement in jail for some offenses. The first jails erected were merely small buildings of squared logs so arranged as to keep a criminal safely. The writer well remembers one of this kind in which a murderer, who was afterward hung, was confined some time. With the gradual growth of the State these were, in most cases, replaced with small brick buildings, often with but one secure room, having a small grated window, and no other provision for light or ventilation. Into this were put indiscriminately all who violated the statutes of the State and subjected themselves to imprisonment. Food was provided and brought by the jailer, and of course its quality and quantity depended much upon his will, and such attention was paid to the neatness and cleanliness of the cells as he thought proper, subject to an occasional inspection by the grand jury or county commissioners. Courts were but seldom held, and often prisoners remained several months awaiting trial. Many such jails are still found in the agricultural counties where there are no large towns and but little crime exists, and they are much of the time without a tenant. But the State has grown rapidly and now num-

bers about 1,800,000 inhabitants; railroads and turnpikes have been constructed in almost every part of it; vast bodies of coal and other minerals have been found, which have already given it, in many places, the characteristics of a manufacturing and mining community; large towns and cities have grown up, and as a natural consequence crime has increased. In some of the county-seats new jails have been built, in which much more attention has been paid to the laws of health and to the physical comfort of the prisoners, and yet too many of these have been built with iron cells and grated doors, affording little obstruction to free conversation and communication among the prisoners; a mistaken idea of kindness has caused most jailers during the day to allow the prisoners promiscuously to intermingle in the halls and corridors, thus opening the way for the hardened criminal to indoctrinate those less so, and for the younger to take lessons in crime from the older. We believe, however, that as public attention is called to the matter, more care will be taken in the construction and management of jails; and already, in some counties, fine buildings are being erected for prisons. The prisoners are not required to labor in any of these prisons, but are kept in total idleness. Books are sometimes furnished by the benevolent, and religious instruction is given occasionally by those who do it voluntarily.

A system of district prisons, in which several of the agricultural counties are united, for those convicted of minor offenses and for the untried, where the prisoners can be kept at labor and some attention given to their moral, educational, and religious improvement, is much needed, and it is hoped may gradually be introduced. There are ninety-two counties in the State; in many of them the jails are untenanted most of the year.

A state prison was first erected at Jeffersonville, opposite Louisville, Kentucky, on the Ohio River, about the year 1822. As was the case with many of the county jails, the cells were built of hewed logs about fifteen inches square, securely dovetailed together. The doors were of thick oak planks bound with iron bands. A hole in the center of the door three inches square was the only arrangement for ventilation. The first year there were seven convicts; three lessees had charge of them, who received from the State a bonus of \$300, in addition to the proceeds of the labor of the prisoners. In the course of a few years this temporary building was followed by a brick one, which was occupied until the present building was erected, in 1847 and 1848. It is of brick, and is surrounded by a brick wall $3\frac{1}{2}$ feet thick and 26 feet high, inclosing about four acres of ground, in which are situated the shops as well as cell-houses. The cells are $7\frac{1}{2}$ feet by 4 and $6\frac{1}{2}$ feet high, with no light or ventilation except through the grated door. There are now four hundred and six prisoners (about twenty of whom are women) confined in the prison. The building is considered wholly unsuitable, and the directors of the prison and the governor of the State unite in urging its abandonment. The system of leasing was abandoned in 1856, and the present plan adopted, by which the labor of the prisoners is let to contractors at a fixed price per day. Most of them are now employed in the manufacture of railroad-cars, under the direction of foremen and men furnished by the car company.

The management and government of the prison is in the hands of a board of three directors, elected by the legislature. These directors choose a warden, chaplain, physician, and moral instructor. The warden has the appointment of a deputy, clerk, and such number of assistant keepers as the directors may deem necessary. The discipline at present is kind, and the officers efficient and good men. Provision is made

by law for the moral instructor to teach such convicts as the warden may think proper "the art of reading, writing, arithmetic, and geography." It is the duty of the moral instructor to "superintend the mental and moral improvement of the convicts, instruct them once every Sabbath, visit them when sick, have charge of the library, and superintend the distribution and use of the books, and adopt such other means for the reformation of the convicts as himself, the warden, and directors may deem expedient."

The increase of prisoners, together with the fact that the Jeffersonville prison is located at the extreme southern part of the State, led the legislature, in 1859, to pass a law for the erection of another prison, at Michigan City, on Lake Michigan, in the north part of the State. This has been completed and in operation several years, and now contains three hundred and forty-one prisoners. The laws and regulations for the government of the Jeffersonville prison are in force for that at Michigan City, and the same methods of labor, discipline, &c., are used. The building is a good one, cells well ventilated and lighted, and sufficient provision is made for the health and comfort of the prisoners.

The whole number of convicts in both the state prisons at present is seven hundred and twenty-seven men and twenty women. These receive by law \$15 when discharged, "and every article of value which they may have had in their possession when received." No other provision is made by law for discharged convicts, nor are there any associations in existence for the purpose. A bill is now before the Indiana legislature providing for a State board of prison commissioners, which shall have charge of the prisons of the State, with a view of bringing about a classification of prisoners and other useful improvements in the prison system.

The constitution of Indiana (adopted 1851) contains a clause that "the general assembly shall provide houses of refuge for correction and reformation of juvenile offenders." This was not practically carried into effect until 1867, when the legislature passed a law for that purpose, in accordance with which a house of refuge for boys was built at Plainfield, fourteen miles west of Indianapolis. It is upon the family system and has two hundred boys, in four separate family buildings, who are employed at work on the farm of two hundred and twenty acres; also in cane-seating chairs, shoe-making, tailoring, and domestic work. Since the opening of the institution about one hundred and sixty boys have passed through it and been discharged, most of whom are filling useful places in the community, a few only having fallen back into crime. The results on the whole have been highly satisfactory. There is a constant pressure for the admission of boys, and it is hoped that the present session of the legislature will make an appropriation for its enlargement.

A law was passed by the general assembly in 1869, establishing "The Indiana Reformatory Institute for Women and Girls," intended as a state prison for women and a girls' reformatory, in separate departments, under the same management, and a building has been erected, but not yet completed. It is much needed, in order to furnish a place for the few women prisoners now confined at Jeffersonville, as well as for a girls' reformatory.

In four or five of the cities of the State there are "homes for friendless women," supported by private contributions.

5. IOWA.

By Martin Heisey, late warden of the State penitentiary.

The institutions established in the State of Iowa for the punishment and prevention of crime are a state prison, a state reform school, and county jails in most of the ninety-eight counties of the State.

The state prison is at Fort Madison, in the southeastern part of the State; but another penal institution is in process of construction at Anamosa, near the center. The discipline aims to be at once deterrent and reformatory. Experience has shown that in the great majority of cases kindness and appeals to reason and manhood are efficacious with the most hardened characters. Special attention is given to cleanliness, and the dietary, though plain, is abundant and wholesome. The result is that we have very little sickness, and a death very seldom occurs. The whole number of prisoners last year was two hundred and eighty, of whom only one was a woman.

The prison has a chaplain, who gives his whole time to the moral and religious instruction and reformation of the convicts, preaching to them on the Sabbath, and laboring with them personally during the week. Every convict is provided with a Bible.

There is a flourishing Sunday-school in connection with the penitentiary. The average attendance is about two hundred and thirty. The school is conducted as Sunday-schools generally are. The citizens in the vicinity show their interest by taking part in the instruction. The good effects of the Sunday-school are seen in these noteworthy facts. First, there is less punishment required to preserve the discipline of the prison by more than one-half than before the establishment of the school. Secondly, the men do more work and do it better. Thirdly, alacrity and cheerfulness have taken the place of moroseness and sullen discontent.

The common jail system needs great reforms. Numbers of the jails are deficient in nearly all the requisites for prisons of that sort.

A state reform school was established in 1868, at Salem, the results of which have been highly gratifying.

6. KANSAS.

By Henry Hopkins, warden of the State penitentiary.

It would be difficult to say what is doing, or has been done, throughout the State, by individuals, outside of the officials immediately connected with the prison. We have to contend with a very general feeling of indifference as to present or future welfare of those committed to or discharged from prison. This is apt to be greater in new than is usually the case in older States. Crime is more prevalent in States newly organized, into which the criminal class has been driven by advanced civilization from other localities.

The principal institution organized for the treatment of criminals is the State penitentiary, at Leavenworth, now only about one-third completed. It is to consist of a main building, composed of two wings of 250 by 60 feet each, with a cell block of four tiers, numbering six hundred and eighty-eight cells in all. Between these wings will be a building 80 feet square and four stories high. A wall 6 feet thick and 24 feet

high incloses a space of ten acres. This inclosure will contain all the necessary out-buildings and workshops.

The discipline is intended to be reformatory in its administration, the prison being conducted on the congregate silent system. Chapel services are held every Sabbath, and all prisoners are required to attend. After the general services a prisoners' meeting is held, at which any who wish may remain and take a part in the exercises. A school is also organized for secular instruction, in which reading, writing, and arithmetic are taught to those who are deficient. The prisoners participate in their earnings to the amount of about \$12 each year, conditioned, however, on obedience to the prison rules. The prison is supplied with a well-selected library. The prisoners are allowed to apply their earnings for the purchase of books and literary papers, or for the benefit of their families.

Commutation, that is, abbreviation of sentence and a restoration to the rights of citizenship, are allowed to all who by good conduct merit these rewards. Permission is given to write letters once each month, and to receive letters once each week from relatives and friends.

The object is to establish such trades as can be followed in this State after discharge, and to every prisoner, whenever possible, is taught either an entire trade or so much of a trade as will enable him to gain a livelihood when discharged. For the general good of the prisoners sedentary trades are excluded as much as possible.

Punishment is avoided in every case where the same result can be obtained by other means. Violations of prison rules are always noticed in some manner, and the punishment of offenders is only administered by the warden or his deputy. Close attention is paid to the physical requirements of the prisoners, and a ready and diligent performance of labor is demanded. The intention is to make the prison pay all expenses, and, if possible, to produce a revenue, because we believe that so the prisoners may be most certainly reformed.

Employment is provided for as many as desire it, on discharge, whenever it can be found. This duty devolves especially on the chaplain, who resides at the prison and devotes his entire time to the duties of his office.

The contract system is not in use here, the industries being carried on by the State, with the exception of twelve men. This I consider far preferable to contracting, as it is seldom that a contractor takes any interest in the reformation of the prisoners, his great aim being to make as much money out of them as possible. The idea of the discipline in this prison is to make better men of those sent to it, and at the same time to so administer it as to deter others from making it necessary to send them here. Make it corrective, and you thereby make it repulsive. Correction is naturally repugnant to the human heart.

We have, as yet, no preventive institution in Kansas under that name, but the Home for Friendless Women, at Leavenworth, subserves that end very effectively, as far as it goes, as the following extract from its first report shows:

Much good has been accomplished by this agency, as it has been the means of saving many from a criminal life.

Two years since the Kansas legislature gave \$10,000 with which to build a "Home." The city of Leavenworth gave lots worth \$2,000, on which to build. The edifice is now completed. It is 43 by 36 feet, composed of four stories, including basement; is of brick, and of tasteful design. It was formally opened October 3, 1871, and has met the needs of the association. With barn, fences, substantial stone walk, and grounds filled with fruit trees and shrubbery, it is an ornament to the city, and stands a perpetual encomium of the liberality and charity of the State which built and the towns

which furnished it. There is no endowment, and no one connected with the institution receives a dollar's pay for time or labor, except its matron. Even our physicians' onerous services are gratuitous. It has extended aid to over two hundred and fifty women. During the last year one hundred and ten have been admitted, and twenty children have been born under its roof. Of these inmates comparatively few have belonged to Leavenworth. The poor and friendless, whom we feed, shelter, and befriend, are not ours alone. They come from other towns and neighborhoods. They comprise respectable women who reach Leavenworth out of money, and needing temporary help, a few meals and lodging, until they can hear from friends. Or they are forsaken wives, who, perhaps, find themselves on the eve of maternity without friends or shelter. Often they are young girls from the country seeking employment, and while doing so come to us for refuge, and if we fail to give it they are easily found of "her whose house inclineth unto death and her paths to the dead." We also have many cases of young girls from other localities, who leave their homes hoping to hide their shame among the crowds of a strange city. Caring for these through the hour of woman's greatest trial—and, when they wish it, adopting their children—we can often save those unpitied mothers from further degradation, and return them to their homes and better lives.

And last, but not least, we wish to keep open a refuge for the only class against which a cold world seems savagely to bar the door of reform—*fallen but repentant women*.

There are two orphan asylums (one Protestant and one Catholic) organized in the State, which are doing much good for the outcast youthful population. Good homes are secured for all when they arrive at suitable ages, and they are watched over after discharge from the institutions.

It is in contemplation to organize a house of refuge at an early day. All these indications show that the *people* are becoming aroused to the necessity of providing for existing wrongs.

Our system of free schools is not excelled by that of any State in the Union, and its fund is inexhaustible. Two State normal schools are now organized, and every school district in the State has its substantial school-building, and is supplied with competent teachers.

Compulsory education is gaining favor throughout the State. This, if properly applied, will act as a great preventive of crime. Would it not be well to re-establish the old Jewish law, and require every boy to learn a trade, as it is seldom, indeed, that a good mechanic is sent to prison from any cause?

7. MAINE.

By Rev. J. K. Mason, former chaplain of the state prison.

The State of Maine was formerly a "district of Massachusetts," and, singular as it may seem, presented the phenomenon of a district several times larger than the State to which it belonged. In 1820 it became itself a State.

In regard to penal and reformatory institutions, Maine is behind several of her sister States. This results in part from having given her attention more to the causes than the cure of crime; to what makes criminals of men than to what will make men of criminals. The grand question has been how to preserve her population industrious, sober, and moral, and thus safe and prosperous. Thus reformatory systems and discipline have been somewhat overlooked, until of late. Maine is clear in her conviction that something more is to be done for her fallen ones, but is nevertheless quite as clear that she must look first at the causes of their fall. The so-called Maine law in regard to the sale of intoxicating liquors is one of the results of this conviction, and not a mere "fanatical

whim," as some have thought. If it be true, as facts demonstrate, that at least three-fourths of all the convicts in the State penitentiary are there through the influence of intoxicating liquors, it has seemed that *wise* men, and certainly *good* men, could not be at a loss where to apply some State force. The wonder is that any are blind enough, either through prejudice or ignorance, to suffer an evil that is so monstrous to continue its havoc and necessitate these penal institutions everywhere as exponents of its accursed entail.

The State penitentiary is located at Thomaston, and is in a condition of great industrial and financial prosperity. In this respect, the past year has exceeded every other in its history. I think I hazard nothing in saying that it is unexcelled. It is conducted on the congregate plan, and every man who is physically able must work at some trade, which he is stimulated in various ways to become master of, so that he may have resources within himself that will in the future diminish his temptation to crime. His educational and religious wants are so cared for, under the direction of a chaplain, that he has no excuse for further ignorance or wickedness. The amount of instruction, however, in both, might be largely increased by means of additional facilities. The sanitary arrangements are good; food plenty and wholesome; an occasional holiday granted, when a sumptuous dinner is given and opportunity afforded for social intercourse for an hour or two, under the eye of the officers and a few friends. Personal cleanliness is insisted on as a virtue indispensable to both physical and moral health. It is the aim of the government in all its rules and practical applications to inspire courage in the convicts—to lift them into as high a measure of manhood as possible with their present surroundings—and to fit those whose sentences are not perpetual to go forth to society and the world again with habits of patient industry, a remunerative trade, and some educational acquirements; controlled by principles or purposes of integrity and sobriety, and stimulated to a faith and hope that will help them through a great many unavoidable difficulties and discouragements.

The Hon. W. W. Rice, who has been warden for the past nine years, not believing in the policy of the contract system of labor, has held the specific control of the industrial and business matters in his own hands, giving personal attention to the various details. He believes that *that* has been one of the grand secrets of its industrial and financial success. Under a less energetic and able financier, the balance-sheet might show footings not so favorable.

The warden is appointed by the governor and council for the term of four years, and has control and is made responsible for all the subordinate officers, concurrently with the inspectors. One of the inspectors, who are also appointed by the executive of the State, is required to visit the prison at least once each month, and the entire board once in three months, to make careful investigation in regard to all the interests of the prison. There is a commutation law by which the executive may deduct a certain portion from the sentence of every convict for industry and obedience. This operates as a constant incentive to all who are not utterly and hopelessly incorrigible.

The present number of convicts is one hundred and sixty-four, one-fifth of whom are under twenty-one years of age. About two-thirds under twenty-seven.

Our county jails are by no means what they should be, but I forbear a description of them as they are, since they are now undergoing careful study, and the probability is that they will be speedily reconstructed in such manner, as to have connected therewith facilities for vari-

ous industries, and for classifying their inmates; and some of them appointed as places of detention, discipline, industry, and other appliances of penal and reformatory treatment for a class of criminals whose antecedents hardly warrant the practice hitherto followed of degrading them as the worst of criminals by commitment to the state prison.

Our State Reform School for Boys is located at Cape Elizabeth, a suburb of the city of Portland, and is at present in charge of the Rev. E. W. Hutchinson as superintendent. It has existed for nineteen years and been attended with somewhat varied success. This school, for certain reasons, does not accomplish all that was hoped from it. One of these is, doubtless, to be found in the statutory provision that, under certain specified circumstances, the several towns or cities patronizing it shall contribute \$1 per week for each inmate they furnish. The result is that they send as few as possible, and the rural towns ignore it almost wholly. Of the fifty-nine commitments the past year nearly one-half were from the single city of Portland. From three other principal cities not a single commitment was recorded. If that provision of the statute were repealed and another substituted requiring the parents to pay such a part of the expense as the town or city assessors might consider them able to do, a demand of justice would be met, a difficulty remedied, and, perhaps, a stimulus created that would operate favorably in regard to home discipline.

This institution is conducted after the congregate system; is under the general direction of a board of trustees, who appoint the superintendent and assistant superintendent, matron, physician, and chaplain, and all the subordinate officers, and assign their position and duties. The whole is under the general supervision of the governor and council. There is a large farm connected therewith, the cultivation of which is carried on by the labor of the boys with a moderate degree of success. The shoe business affords employment for a score or two of the boys, and chair-bottoming for as many more; and a large number of the youngest are employed at knitting, sewing, &c., for the older ones. The various other kinds of work about the institution are done by the inmates, under the direction of departmental overseers. The educational department is in charge of several teachers, selected with reference to the different grades, according to which the inmates are classified. Most of the boys make good proficiency.

The Sabbath-school work is carried on by the voluntary efforts of Christian men and women from the city. Based on the influence of this and on the acquiring of habits of industry, of which, on entering, nearly all are destitute, the friends have learned to recognize their main reliance for reform. At the close of 1871 the school numbered one hundred and thirty-four, twenty-six less than the preceding year. The whole number committed in eighteen years of its history is one thousand two hundred and eighty-one, of ages varying from seven to nineteen years.

Of the whole number, more than one-third had intemperate parents; another third had relatives in prison; two-thirds were habitually idle. More than two-fifths were truants; nearly one-half were Sabbath-breakers; more than three-fourths were untruthful, and more than two-thirds were profane: a sad commentary on the places many children are allowed to call "home," and still worse on the character of their parents.

The institution is sustained by the products of its own labor as far as that will go; the residue, about one-half or two-thirds of the expenses,

being provided for by appropriations direct from the State treasury. All its business transactions are conducted on the cash basis.

An industrial school for girls is partially inaugurated, and it is expected that the current year will see it in operation.

Maine believes that penalty should be administered as far as possible in the interest of reform.

8. MARYLAND.

By G. S. Griffith, president of the Maryland Prisoners' Aid Association.

The prominent penal reformatory and preventive institutions of Maryland are situated in the city of Baltimore and its immediate vicinity.

The prisons, properly so called, are the State penitentiary, the Baltimore jail, and twenty-one other jails in the several counties additional to that of Baltimore.

The State penitentiary is in Baltimore. The whole number in the prison at the close of 1872 was 598; of whom 541 were males, and 57 females; of the males, 371 were colored; of the females, 52. There were received into the prison in 1869, 317 prisoners; in 1870, 280; in 1871, 262; in 1872, 188. This statement would indicate a gradual decrease of crime in Maryland within the last four years.

While the discipline is positively deterrent, it earnestly aims to be reformatory. The agencies employed are *moral suasion, positive discipline, labor, and rewards*. Rewards, however, are more relied upon than punishments, and with the best results.

The general condition of criminals in point of education, on their commitment, is lamentable. Unhappily no systematic effort is made for their mental improvement while in prison. The penitentiary, however, contains a very good library for the use of the convicts.

The labor of the prisoners is let to contractors. It is believed that this institution will be hereafter self-sustaining, the opportunities and organization of labor having been improved by the enlargement of the workshops.

There are no religious agencies officially employed, but the Prisoners' Aid Association, to be hereafter spoken of, takes charge of this work. It has established two flourishing Sunday-schools in the prison, which are taught by ladies and gentlemen who volunteer their services. These religious exercises are much prized by the prisoners, and excite the lively interest of all who witness them. Sacred music is taught to the prisoners as an element of reform. On Sunday afternoons the male and female convicts are assembled in separate chapels for divine service. The officiating ministers are selected from different denominations. It is optional with the prisoners to attend or not. Three hundred and forty-three availed themselves of the privilege last year.

The Baltimore City Jail is a substantial stone building, of striking architectural proportions. In its construction and arrangements it may be regarded as a model institution. Most of the other county jails are defective in all the attributes of a good prison. Under the auspices of the aid association, religious exercises are regularly conducted on Sunday afternoons in the chapel of the Baltimore jail.

The reformatory and preventive institutions of Maryland are the Baltimore House of Refuge, the Maryland Inebriate Asylum, the Home of the Good Shepherd for Women, the Maryland Industrial School for

Girls, the Home for Fallen Women, the Saint Mary's Industrial School for Boys, the Manual Labor School, the Children's Aid Society for Boys and Girls, the Home of the Friendless for Children, and the House of Reformation and Instruction for Colored Children.

The House of Refuge is situated two miles from Baltimore, in a high and healthy location. The building is constructed with a view to develop the physical as well as the moral and mental growth of the inmates. This is the most important reformatory in Maryland for juvenile delinquents. It is designed to receive the youth of our State who become too insubordinate to be governed by their parents or guardians, and for those who are sentenced by the criminal courts and magistrates for committing public offenses. They are sent to the care of this institution until they become of age, unless otherwise provided for by the board of managers in consideration of great moral improvement, which often occurs under the excellent administration of the superintendent, Mr. William R. Lincoln.

Religious instruction is given without any denominational bias. The institution contains a commodious chapel. Divine service is conducted every Sunday afternoon by clergymen invited from various denominations. The congregational singing is led by Mrs. Lincoln, the worthy wife of the superintendent, who presides on all occasions with perfect command of the organ.

The usual exercises of a Sunday-school are regularly observed; the helpers in this good work consist of a faithful corps of teachers, who go out from the city every Sunday morning.

Music is a particular element of education of the boys. They have organized a brass band, which is the source of much pleasure on public days and festive occasions. They are frequently invited to the city, to play at fairs, and other entertainments held for benevolent purposes. The other branches taught are those of a primary common school. The larger boys receive instruction equal in grade to that of the grammar-schools, including the elements of natural philosophy, physiology, algebra, &c. The refuge is at once a benevolent, reformatory, and educational institution. Since it was opened in 1855, 2,159 minors have passed under its control, of whom 1,942 were boys, and 217 were girls. At the present date there remain under care 331, of whom 315 are boys and 16 girls.

Labor is found to be a most desirable adjunct in the effort of reform. The workshop, next to the Sunday-school and secular instruction, is the best corrective of evil habits. Here the boys are employed in the harness shop, shoe shop, tailor's shop, broom and basket shop, in caning chair-seats, &c., and in farming and gardening, besides assisting in the work of the household. The products of the farm and garden last year amounted to \$2,248.28. The institution is in part self-supporting, yielding a profit from the mechanical labor of the inmates.

The Saint Mary's Industrial School for the city of Baltimore is a Roman Catholic institution. Its object is to receive, teach, and train to virtue and industry orphans and other destitute boys. It has an imposing building and a farm of one hundred acres. The boys are committed to this school, not for crime, but on account of destitution and to *prevent* crime. It has received in all two hundred and sixty-nine boys, of whom fifty-one have been apprenticed to farmers.

The Baltimore Manual Labor School, for indigent boys, was established in 1842, and has had an average of forty-five boys. It is neither penal nor reformatory, but preventive. It receives only orphans or half-orphans. It has a farm of one hundred and forty acres. The

boys, on leaving the institution, are apprenticed to some mechanic or farmer.

The Boys' Home is not a reformatory, such as the house of refuge, nor is it a house of correction, where coercion or force can be employed to compel obedience. It is a large household, wherein obedience is recognized as a duty, and love is the incentive to its exercise. Like any well-regulated family circle, it has its daily separations and reunions. After breakfast each member goes out to his appointed labor. The directors find the system of encouraging volunteer labor to work admirably. The boys are assisted to find work, and get fair wages. Most of them are learning mechanical trades. Those who have employment are charged the small board of \$1.75 per week. The balance of their earnings is put into a savings-box until the end of the year, and then returned to them. This arrangement generates feelings of independence and self-respect. Under the genial influences of the Home, they are taught habits of economy, cleanliness, virtue, industry, obedience, and self-reliance. It prevents vagrancy, pauperism, crime, and juvenile delinquency. This is a great saving to taxpayers, and sound political economy.

The Maryland Industrial School for Girls is designed to rescue girls between twelve and eighteen years of age, who have lost their virtue or are in danger of losing it, from vagrancy and exposure to evil influences. Since the opening, in 1868, seventy-two girls have been received. The discipline of the school is that of a Christian family. Its law is kindness. There are no walls or bolts. No corporeal punishment is permitted. Deprivation of privileges and meals, with detention of the refractory in her room until penitent, is sufficient. The ordinary branches of a common-school education are taught, with singing and Bible lessons. Instruction is also given in all branches of household labor, and in canning fruits and vegetables. The improvement of the girls in all respects has been very marked and gratifying while in the institution. Thirty-four have been restored to their friends, twenty-three have been provided with situations, two have died; the rest are either now in the school, or have been discharged for disease or other causes. Religious instruction has been regularly given.

The Children's Aid Society is a recognized temporary asylum for all truant and stray children picked up in the streets by the police, and for children whose parents have been committed to the jail or almshouse for disorderly conduct or vagrancy. In many cases they receive food and shelter until they are found by their parents, or reclaimed by others after they are released from confinement. Since the institution was opened, in 1860, 1,092 children have received its protection. At present 330 are in good homes provided for them either in Maryland or in the neighboring States of Pennsylvania and Virginia. Their foster-parents, or those who take them in charge, are required by the board of managers to make monthly reports concerning their welfare.

The Home for the Friendless is a preventive institution under a board of lady managers. It receives small boys and girls, the neglected, deserted, unhealthy, maimed, crippled, and also the incurably afflicted. The total number of inmates received since it was organized is 1,042. Of these there remain at present date 130, many of whom are under eight years of age.

The House of Reformation and Instruction for Colored Children was incorporated by the general assembly of Maryland at the January session, 1870. Maryland has a large colored population, especially since the emancipation of slaves. This population, which has heretofore been

deprived of the benefits of education, is now thrown upon us in a deplorable state of ignorance. Ignorance, idle habits, and crime generally go hand-in-hand together, and become an element of danger to the community. The board of visitors of the Baltimore city jail report the following commitments of colored persons during the past year: For the violation of the peace and for drunkenness, 1,890; for larceny, 375; for vagrancy, 70; in all, 2,335, many of whom were children between the age of eight and ten years.

A farm, containing 700 acres, in Prince George's County, has been purchased for this institution. Appropriations have been made by the State legislature of \$10,000 for two succeeding years, making a total of \$20,000. Twenty thousand dollars additional have been contributed for this object by Enoch Pratt, esq., and ten thousand dollars more by subscription.

Such is a brief and imperfect sketch of the preventive and reformatory institutions of Maryland.

What is the chief cause of crime? Neglect of the early right training of children. What is the chief preventive of crime? Increase the forces a hundredfold to save the children. The unrestrained boys and girls of our community are the roots of that cancer which grows into public injury. It is a sad, stern truth that some of those who are now boys and girls are to be the paupers and criminals of the future. No one doubts that many noble and useful citizens come from the ranks of the poor. Yet it is no less true that paupers and criminals spring almost entirely from the untrained outcasts of society, such as neglected orphans, children of drunkards, the illegitimate children of prisoners and paupers, and the children of thieves.

The situation of the reformatory and preventive institutions of Maryland is a subject worthy of note. They are located in the most healthy sections of the city or county of Baltimore, on broad streets, wide avenues, or eligible farms, the sanitary advantages having been always considered in selecting a site. The buildings are erected on high grounds, affording spacious yards or areas for exercise during the hours of recreation. They are constructed with large windows, wide passages, and broad stairways, with a view to obtain the unobstructed rays of light from the rising to the setting of the sun, and a free and full circulation of pure air. It is a fact which marks the history of these various institutions, that the inmates are exempt in an extraordinary manner from epidemics or even sporadic diseases. Their list of mortality records fewer deaths than occur in common households among the same number of children and youth.

Experience teaches that the essential elements of health will promote the moral as well as the physical growth of human nature. The genial influences of air and sunshine will penetrate the heart and generate kindly feelings, stimulate bright thoughts, and excite the hands to useful works.

The work of aiding discharged prisoners is well organized in this State. The Maryland Prisoners' Aid Society was established early in 1869, and has been ever since working with zeal, efficiency, and success. The sphere of action of this society begins in the State penitentiary, and extends to all the jails and almshouses throughout the State of Maryland. The officers and wardens seem willing to co-operate in any measures the association may suggest to improve the condition of the inmates under their charge. The principles on which it works, and the work itself, have secured the hearty approval of both the criminal courts and the prison authorities, as the following testimonies abundantly prove.

Judge Gilmor, of the criminal court of Baltimore, says: "I take great interest in the successful operations of this society, which I regard as one of the best and most important of our public charities. It has already accomplished much good, and if the welfare of that large class whose condition it is its aim to relieve, is not deriving all the benefit it should, it is only because enough of our charitable citizens have not as yet come forward to unite in and contribute toward the objects proposed by the association."

In their last annual report the board of visitors of the Baltimore city jail remark: "The Prisoners' Aid Association, of which Rev. Penfield Doll is the agent, and whose benevolent work among the fallen and guilty it has more than once been our pleasure to acknowledge, is continuously at work, and making its influence for good widely felt."

9. MASSACHUSETTS.

By F. B. Sanborn, member of the Massachusetts Board of State Charities.

Massachusetts, which by the census of 1870 had a population of 1,457,351, now contains more than a million and a half inhabitants, of whom only about 14,000 are colored persons, while nearly 400,000 are of foreign birth, and more than 630,000 of foreign parentage. It has been estimated that from 25,000 to 30,000 of these inhabitants belong to what may be called the criminal class, including drunkards and vagrants, who, under Massachusetts laws, are punishable with imprisonment. The actual number of different persons imprisoned in a single year (exclusive of pupils in reformatories) is now probably about 15,000, and steadily increasing. The number of persons convicted of greater and smaller offenses, in 1872, was about 8,000, probably; but of these only 160 were sent to the state prison at Charlestown. The average number in all the prisons, commonly so-called, including persons waiting trial, or held as witnesses, was 3,218, of whom 543 were in the Charlestown prison, and 298 in the State work-house at Bridgewater, making 841 under direct State control; something less than 2,000 were in houses of correction and other convict prisons under city and county control, and 429 were in the county jails. The whole number in prison in Massachusetts on the 1st of January, 1873, was about 3,280; namely, 576 in the state prison at Charlestown, 228 at the Bridgewater State work-house, 1,440 in thirteen county houses of correction, 582 in the Boston work-house or house of industry, and 454 in seventeen county jails. Add to these the number temporarily imprisoned that day in guard-houses, police-stations, &c., and the aggregate would exceed 3,350. The figures of the census of 1870, in regard to crime in Massachusetts, are very incorrect.

The number in the State, city, and county prisons, exclusive of the guard-houses and station-houses, on the 1st of October, 1872, was reported as 3,461, of whom 562 were at Charlestown, 267 at Bridgewater, 657 in the Boston house of industry, 440 in the South Boston house of correction, 250 in the Boston jail, 266 in the Cambridge house of correction, 152 in the New Bedford house of correction, and 112 in that at Ipswich. The whole number in the jails was then 552; in the houses of correction 1,423; and the aggregate, 3,461, was the largest ever reported in Massachusetts.

In the three large public reformatories of Massachusetts, the State Reform Schools at Westborough and Lancaster, and the Boston House

of Reformation, controlled by the city, the whole number of inmates, January 1, 1873, was 725, namely: 297 boys at Westborough, 128 girls at Lancaster, and 300 (boys 260, girls 40) at Boston. The average number for the year 1872 was something more than this, namely: 267 at Westborough, 122 at Lancaster, 75 at the School-Ship, (now discontinued,) and 280 at Boston; in all about 740. The average number confined in prisons and reformatories in Massachusetts may therefore be stated in round numbers at about 4,000, though there are a few small city reform-schools which would bring the aggregate above that amount. In the preventive schools, such as the State Primary School at Monson, with an average last year of 361, the House of the Angel Guardian, (a Roman Catholic school,) in Boston, with an average of 175 pupils, the Boston Farm School, with 100 pupils, and a few other establishments, there were between 700 and 1,000 inmates. Therefore the constant population of the penal, reformatory, and preventive establishments in Massachusetts, public and private, may be taken as not exceeding 5,000, or one in every 300 of the inhabitants.

The prisons.

I. The Charlestown state prison is one of the oldest in the country, having been begun in 1800, and opened in 1804. It has been conducted on the Auburn, or silent congregate system, since 1827, when it was rebuilt, but has since been much enlarged, containing now about 600 cells. A plan has been submitted to the legislature of 1873 for building a new state prison at a greater distance from Boston, and it is probable that the Charlestown site will be abandoned within the next five years.

No women have been sentenced to Charlestown for more than fifty years, or since 1820, and no man is sentenced there for a less period than one year. Of 562 convicts there, October 1, 1872, 62 were sentenced for life, 11 for twenty years and upwards, 50 for ten years, 31 for periods between ten and twenty years, 106 for five years, 84 for periods between five and ten years, 104 for three years, 47 for periods between three and five years, and 65 for less than three years. The number of colored prisoners was 40; 97 were born in Ireland, 30 in Great Britain, 21 in the British-American provinces, and 382 in the United States; of these, however, nearly one-half were probably of foreign parentage. Of the 562, 77 were recommitments, and of 160 convicts received in 1872, 24 were recommitments. The whole number in prison during the year was 703, of whom 19 died, 16 were pardoned, 3 sent to lunatic hospitals, and 1 escaped. The average number in prison being 543, an average of 91 were reported as unfit for contract labor. The other 452 convicts earned by contract labor the sum of \$126,010, or about \$10,000 more than it cost to support the prison. The average price per day for contract labor was 99 cents, which is believed to be 41 cents less than its real value to the contractors. The expenses of the Charlestown prison for the year 1872 were about \$116,000, of which something less than \$800 was paid for the education of prisoners, about \$37,000 for provisions, and \$42,362 for the salaries of officers. A school numbering from 100 to 150 convicts is held about two evenings in the week, and there is a Sunday-school of something more than 100 convicts. The number of volumes in the prison library is 2,236, of which about 100 are daily lent to the convicts.

II. The Bridgewater state workhouse is a new institution, being created in 1866, and opened the same year in the old buildings of the state

almshouse at Bridgewater, near Plymouth. Its inmates are mostly drunkards, vagrants, prostitutes, &c., who apply to the State or to the municipalities for support, and are sentenced to support themselves by labor. A great majority of them are women, and it is proposed by Governor Washburn, in his last message, now before the legislature, to make this workhouse a prison for women exclusively. It is, in fact, a prison of the same grade as the county houses of correction and the Boston House of Industry. The whole number of convicts there in 1872 was 596; the average number was 298, and the cost of their support was \$34,662. Their earnings from labor were \$1,654, and the net cost of their support was about \$33,000.

III. The Boston House of Industry was established about forty years ago, and is the city prison of Boston for vagrants, drunkards, prostitutes, &c., containing more convicts than any other prison in the State. A majority of these are women, as in the state workhouse. The average number of both sexes in 1872 was 576, the cost of supporting them \$76,853, and the earnings from their labor \$13,987, showing a net cost of \$62,866. This prison, like the South Boston House of Correction, is controlled by the city authorities.

IV. The county prisons are numerous and various, there being fourteen counties in Massachusetts, and each being entitled, should it need them, to maintain one or more jails, and as many houses of correction. The distinction between these two classes of prisons in law is simply that in our jails labor is not required, while it is compulsory in houses of correction. But in practice (although a few persons are still sentenced to jails) convicts alone go to houses of correction, and persons awaiting trial, or the execution of sentence, remain in jails. Where the sentence is a fine, as in more than half the cases tried in Massachusetts it probably is, the person fined, if unable or unwilling to pay it, generally goes to jail for a short time. There are, in fact, eighteen jails and sixteen houses of correction in the fourteen counties, which were used as prisons in 1872; but of these only four jails (at Boston, Salem, Lowell, and Newburyport) and two houses of correction (at Ipswich and South Boston) were separate establishments. The other fourteen county prisons contained each a jail and house of correction under the same roof and management, so that there are but twenty distinct county prisons, which are located two at Boston, and one each at Barnstable, Pittsfield, New Bedford, Edgartown, Ipswich, Lawrence, Newburyport, Salem, Greenfield, Springfield, Northampton, Cambridge, Lowell, Nantucket, Dedham, Plymouth, Fitchburgh, and Worcester. At Taunton a new jail is building, to replace an old one. The number of prisoners in these twenty establishments ranges from one to four hundred and fifty in each, and almost every variety of prison architecture and prison management, except the best, may be found in them. The largest jail is in Boston, situated on the Charles River, between the two bridges leading to Cambridge, and containing an average of more than two hundred prisoners, whose support in 1872 cost not far from \$25,000, or nearly \$2.50 a week *per capita*. The largest house of correction is also in Boston, with an average number of convicts, in 1872, of 420, who earned \$7,733 above their expenses. The whole number committed to all the jails was above 6,000, to the houses of correction above 5,000, but many were identical in the two classes of prisons. The average number in all the jails was 429; in all the houses of correction, 1,372; in all the county prisons, 1,801. The cost of all these, above their earnings, was \$154,711. There was paid for officers' salaries in these county prisons, \$82,000; for provisions, \$103,000; for

purposes of education, mostly chaplains' salaries, \$2,709; for clothing and bedding, \$21,500; for fuel and lights, \$40,000. The average net cost for each prisoner was within a fraction of \$86 a year, or nearly \$1.70 a week.

The gross expenditure was \$283,847, and the earnings from labor \$129,136. The difference between these two aggregates represents the net cost, as above given. A little more than one in ten of the jail prisoners are women, and nearly one-third of these are in the houses of correction. More than one-half of both sexes were foreign-born, and probably four-fifths were of foreign parentage.

An attempt is now making, in the legislature of 1873, to change materially the management of the county prisons. To show the need of some better system than exists at present, a passage may be quoted from a paper submitted from the United States to the London Prison Congress of last July:

There is no better illustration, probably, of the whimsical lack of all proper centralization of prison authority in the United States, than the present condition of the laws and their administration, as regards prison inspection and management, in Massachusetts—the State which is often considered, and certainly considers itself, as foremost in prison discipline, not only in America, but in the whole world. In some respects, no doubt, Massachusetts holds an advanced position, but whether this is true of her system of prison management may be judged from the facts now to be stated. Within her borders are three distinct classes of prisons—those of the State, of the fourteen counties, and of the cities and towns. There are two state prisons, viz, at Charlestown, near Boston, and at Bridgewater, not far from Plymouth, wholly distinct in their management, except that the board of State charities, which has the power of discharge at Bridgewater, has the general inspection of both, but with no authority to appoint officers or to establish rules in either. The governor and council of the State have also general powers of inspection, and can pardon convicts in the Charlestown prison, as well as appoint the chief officers of both state prisons. But, besides these two boards of inspection, there is also a board of inspectors for Charlestown, and another for Bridgewater, quite independent of each other; and these two boards, in concert with the warden or master of either prison, manage all the details of its affairs, and report both to the governor of the State and to the board of State charities. There is a prison commission also, which has no duties concerning the Charlestown prison, but which may visit and inspect the other; there is an "advisory board" of ladies, to assist the prison commission; and, finally, there is every year a prison committee of the State legislature, which visits and reports upon both state prisons, but has no power to do anything further. Thus there are seven distinct commissions to look after these two prisons, including in all no less than thirty-seven official persons, all more or less charged with the duty of inspection, but without any practical co-operation with, or subordination to, each other. Then there are fourteen counties in the State, each containing one jail, and several containing two or three each, which are under the control of the county sheriffs, chosen by the people, for terms of three years, and of a board of commissioners in each county chosen in the same way. But in the largest county (Suffolk) and the smallest (Nantucket) there are no county commissioners, the municipal governments of Boston and of Nantucket Town taking their place. These jails are also inspected by the board of charities (when it chooses) and by the prison commission, the advisory board, and the prison committee of the legislature; and may be inspected by the governor, who has power to remove the county sheriffs. There are nineteen of these jails, each controlled and inspected by six different boards, including in all about seventy-five official persons. Then there are fifteen other county prisons for convicts, called houses of correction, thirteen of which are managed by the county commissioners above mentioned; one by the "selectmen" of Nantucket Town; and one, the largest of all, by a Boston board, called the directors of public institutions of the city of Boston; which also has under its control another great Boston prison, known as the house of industry. In each county the commissioners appoint another board, called overseers of the house of correction, who are to inspect those prisons and have some control of their management; these number in all about forty, and the Boston board has twelve members, thus adding some fifty more official persons to the long list. All the houses of correction may be visited and inspected by the board of charities, the prison commission, the advisory board, and the prison committee, as well as each by its own overseers and commissioners, or directors, and by the governor and council, who have the pardoning power jointly with the overseers; so that there are eight distinct boards, comprising about 120 persons for these fifteen

prisons. The Boston house of industry, however, is exempt from all inspection save by its own directors and the prison committee of the legislature. Next come the city and town guard houses, or police stations, of which, perhaps, there are one hundred and twenty in the whole State, under the charge of the municipal governments, and rarely inspected by anybody else. The managers of these small prisons probably number about 300, and are annually elected by the people. Finally, there are the city and town work-houses, large and small, numbering, perhaps, a dozen in all, and managed by a few of the same 300 municipal officers. In all, we may count up for the Massachusetts prisons not less than 350 different official persons concerned in their management and inspection; the number of prisoners in them all never exceeding 3,500 at any one time.

From this we might infer that the Massachusetts prisons were thoroughly inspected, however perplexing might be the system under which it was done. But, in fact, there is no municipal inspector who has been in all the municipal prisons; no county inspector who has been in all the county prisons; few State inspectors who have been in all the county prisons or any of the municipal ones; and no one official person in the State who has ever visited half of the prisons it contains. Consequently, there is no proper knowledge anywhere of the relation of one part of the prison system to the rest, and no proper system at all, but only a confusion of laws, rules, boards, and details. There are wheels in plenty, and wheels within wheels, more than the sacred prophet saw in his vision; but there is no "spirit within the wheels" by which they are regulated and made to move harmoniously. Probably no other State enjoys so complicated and various a prison system as Massachusetts, in which are as many devices and contrivances as in the cabinet where the Abbé Siéyes, in Burke's famous satire, manufactured constitutions for France. Unfortunately these devices, however ingenious, result in neutralizing responsibility, deadening the public vigilance, and opening the door to culpable neglect and to petty corruption. The instruction, the reformation, the discipline, and even the life of poor prisoners may be sacrificed in the medley and delay of so much legal machinery; for each of these important things, like Johnson's hero, is

Condemned, a needy suppliant, to wait
While ladies interpose and *boards* debate.

In connection with the Massachusetts prisons, three isolated facts offer themselves to the recollection of the present writer, not connected by any necessary chain of cause and effect with the system just described, but perhaps illustrative of it. During a debate concerning one phase of the prison question in the Massachusetts legislature on the 6th of May last, a Boston member, who had probably never seen the inside of ten among the 150 prisons of his State remarked complacently, and evidently with the approval of the house, that "Massachusetts had the best prison system in the world." A few weeks previous—in consequence of the acceptance of a gift by the highest prison superintendent in the State, at the hands of a contractor, who gave it for the manifest purpose of securing a favorable bargain for himself from the prison government—the last touch had been given to this perfect system, in the same legislature, by the passage of a law forbidding any prison officer to take bribes. And just a week after the speech above cited, that is on the 13th of May, the grandson of one of the most illustrious statesmen of Massachusetts in former years, a youth of amiable character, but unfortunate habits, was fatally burned in a Boston guard house, through the neglect of the policeman who had locked him up there, alone and helpless, and in the midst of combustible materials. Thus, on one side of the official eulogist is corruption in the chief officer of the highest prison, long undetected and still unpunished; while on the other side is a horrible casualty in the lowest prison, of which official negligence was the direct cause. It may not be unjust to consider these events as a commentary on the intricate prison system of Massachusetts, itself the successive growth of many years spent in trying to avoid what can alone govern prisons well, a central, simple, and vigilant method of control and inspection.

In the above statement some repetitions of what had before been said may be noticed; and also some additional facts and some discrepancies as to the number of county prisons. The latter result from the varying use of these prison buildings in successive years, and are only apparent discrepancies. In the main the passage quoted is still true to the facts; but should the recommendations of Governor Washburn and of the prison commission be accepted by the legislature, much of this ridiculous jumble of petty authorities would be done away with. The plan is to bring all the county prisons and the Boston House of Industry under State control, by establishing a system of district prisons, the details of which are set forth in the report of the Massachusetts prison commission—

ers for 1872, lately submitted to the legislature. The districts proposed are seven in number, of very unequal population and criminal conditions, but arranged with reference to the present county lines, and to the prison buildings, which will continue to be occupied, though with a different classification of prisoners, if the new plan is adopted. The districts proposed are Suffolk and Norfolk, with a population, in 1870, of 360,245, but now increased to 380,000, and containing four prisons, three in Boston and one in Dedham; Middlesex, with a population, in 1870, of 274,353, now increased to nearly 300,000, with two prisons, at Cambridge and at Lowell; Essex, with a population of 200,843 in 1870, now increased to 210,000, with two prisons, at Lawrence and at Salem; Worcester, with a population, in 1870, of 192,716, now increased to more than 200,000, and containing two prisons, at Worcester and at Fitchburgh; Southern Massachusetts, including the five counties of Barnstable, Bristol, Plymouth, Dukes, and Nantucket, with a population, in 1870, of 208,905, now increased to 215,000; the Connecticut Valley, including the three counties of Hampden, Hampshire, and Franklin, with a population, in 1870, of 155,432, now increased to 160,000; and Berkshire, the seventh and last district, with a population, in 1870, of 64,827, now increased to 68,000. The prison population of these seven districts, October 1, 1872, was 1,406 in the Suffolk district, 358 in Middlesex, 306 in Essex, 180 in Southern Massachusetts, (exclusive of 267 at Bridgewater,) 172 in Worcester, 136 in the Connecticut Valley, and 74 in Berkshire; in all 2,632, exclusive of the 829 at Charlestown and Bridgewater, under State control.

The Southern Massachusetts district will have two chief prisons, at New Bedford and at Taunton, with small jails at Plymouth, Barnstable, Edgartown, and Nantucket; the Connecticut Valley district two chief prisons, at Springfield and at Northampton, with a jail at Greenfield; and the Berkshire district one prison, comprising jail, work-house, and house of correction, under a single roof. In each of the six larger districts there is to be, by this plan, a work-house and a house of correction in separate buildings, and generally in different cities, the former for vagrants, drunkards, &c., who now make up more than half our convicts, and the latter for more heinous offenders. In each prison will be jail-cells, to be used as the jails now are, except that in Suffolk County the Boston jail will receive all such prisoners. Each of the seven houses of correction is to be governed by a resident master, appointed by the governor and council, and each master is to appoint a resident deputy to govern the work-house in his district. The jails are to remain in part under the control of the county sheriffs, as at present.

The new scheme is by no means free from complications and inconsistencies, and is probably too extensive to be carried as a whole; but it is a great improvement on the present system, and some part of it will probably soon be adopted. Gradually the superior advantages of district prisons over county prisons will be seen, and the so much needed classification of prisoners, now almost wholly neglected in Massachusetts, can in time be attained. With that will come better prison schools, a better-organized system of labor, and more thorough and therefore more successful efforts to make our prisons truly reformatory. At present they are so only to a very slight degree; nor do they perceptibly check crime, which, since 1864, has apparently increased in a much greater ratio than our population. In 1865 there were less than 2,000 inmates of all the Massachusetts prisons; five years later, October 1, 1870, there were 3,121; at the same date in 1871 there were 3,224; in 1872, 3,461; and at the beginning of 1873 about 3,280, as has been said. The average

prison population in 1870, was 2,971; in 1871, 3,145½; and in 1872, 3,218. There has, therefore, been in seven years an apparent increase of more than 60 per cent. in the number of criminals, while the population has not gained more than 25 per cent.

Prisons for women.

There is not in Massachusetts, nor has there ever been, a distinct prison for women, though the average number of women in prison here has been from 600 to 800 for the last eight years. Of the prisoners in confinement October 1, 1870, 754 were women; at the same date in 1871, 758 were women; October 1, 1872, there were 770 women in prison. The recommendations of Governor Washburn, seconded by the prison commission, include the conversion of the State work-house at Bridgewater into a State prison for women alone, to which those now in the county and city prisons would be sent. It is probable that this plan, which meets with much popular favor, will be put in practice the present year.

Prison schools.

Little has yet been done in Massachusetts to give school instruction to prisoners. The importance of this branch of prison discipline has been urged upon the legislature and the prison officers by the board of State charities ever since 1865, and, in consequence, a few prison schools have been opened. That at Charlestown is the largest and the most useful, but is far from equaling, either in plan or management, the excellent schools of Mr. Brockway, at Detroit. In the county prisons and at the Bridgewater work-house a few prisoners have received instruction. But the officers, as a rule, do not understand the necessity for prison schools, and the contractors are practically opposed to them. Should the proposed changes in our prison system be made, the education of prisoners could and probably would be much better cared for.

Cost of our prisons.

The cost of the present prison buildings and lands, incurred during the last seventy-three years, cannot have been less than \$3,000,000, although an exact computation is impossible. About a third part of this sum has been paid for construction, enlargement, &c., at the Charlestown prison alone; and the estimated cost of a reconstruction of that prison at Newton, or in some other convenient locality near Boston, is a million of dollars, to be re-imbursed in great part by the sale of the estate at Charlestown. The annual interest on \$3,000,000 is \$180,000, or an average for each prisoner of more than \$50 a year, or about a dollar a week. The actual current expenses of the prisons above named, for the year ending October 1, 1872, were about \$511,000, to which, if we add the cost of maintaining the one hundred and thirty town and city prisons for temporary detention or occasional sentence of petty offenders, we shall have a total of about \$550,000. From this should be deducted the earnings from labor of convicts, fees of visitors, and petty sales, amounting, in the year 1872, to about \$275,000; leaving, as the net cost of maintaining some 3,300 prisoners, (the constant average,) about \$275,000, or more than \$80 each. This is a larger net cost and a greater number of prisoners than for several years past, but the prison earnings are also greater than in any year before. In the county prisons these earnings have very much increased since

the close of the war. In 1865, with an average number of 1,050, the county prison earnings were but \$34,694; in 1868 they had more than doubled, being \$69,625 for 1,554 prisoners; and now they have almost doubled again, being \$129,186 for 1,850 prisoners. Yet even now they are from \$50,000 to \$100,000 less than they might be if the county prisons were properly classified, and the most thorough labor system employed. We see that 543 convicts at Charlestown have earned almost as much as 1,850 in the county prisons; or to be more exact, as much as 1,370 convicts in 16 houses of correction, for the jail prisoners, mostly waiting trial, are not compelled to labor. There is no good reason why, with the exception of these jail prisoners, averaging from 400 to 500, and costing from \$75,000 to \$100,000 a year for their support, the whole annual cost of our prisons should not be paid by the labor of the convicts, who would thus become self-supporting. Few of them are too feeble to do any work, more than two-thirds of them are men, and the demand for such work as they can do is constant and remunerative. The largest contractors for prison labor in the State, the Tucker Manufacturing Company, who grumbled because the authorities made them pay \$1 a day for skilled mechanics, have lately paid to another contractor \$15,000 for the right to use his 100 men at 90 cents a day, for a single year. This is about 50 cents a day additional, or \$1.40 for each man, which the state prison inspectors say is a fair contract price for them. Probably they earn for the contractor at least \$2 a day. In the county prisons the labor is not so well trained nor so valuable, but at the South Boston house of correction the whole number, some 450, both men and women, earn their support, and something more; and the surplus that might be earned by the strong and more skillful would make good the deficit on the weaker and worse trained workmen in the county prisons. At the same time, such a classification of the convicts as would make their labor most profitable would render it easier to give them school instruction, religious discipline, sanitary advantages, and all that tends to make prison life reformatory.

The reformatories.

If an examination of the Massachusetts prisons is far from satisfactory, and shows that they need immediate and thorough re-organization, this is by no means the case with the reformatories for young offenders. These were never in so bad a condition as our prisons, and they have been for several years growing better, and doing their work more thoroughly. The nautical reformatory, or school-ship, which had outlived its usefulness, and become a burden instead of a help to the reformatory work of the State, was finally abolished in July, 1872; the preventive institution at Monson, known as the State Primary School, established by law in 1866, has gone steadily forward in a very useful work; while the "Visiting Agency," providing homes in families for young delinquents, and neglected or orphan children, has almost revolutionized the old policy of the State and of the courts. All these changes may be said to have grown out of the action taken by the board of charities, which first established a visiting agency in 1866, in connection with the Monson Primary School, and first called attention to the defective condition of the nautical reformatory in the same year. In the six years that have since gone by, such changes have taken place as would scarcely be credited but for the unimpeachable evidence of statistics. In 1867, when the new policy first began to take effect, the average number of pupils at the State reformatories was 752, and the

sum drawn from the State for their support was more than \$140,000; in 1872, the average number of pupils was but 464, including 75 on board the school-ship, and the sum drawn from the treasury for their support was but \$96,695, including \$23,703 for the school-ship, now abolished. During the current year, 1873, the average number of pupils will scarcely equal 400, and the sum drawn from the treasury will be but little more than \$70,000, or half what it was six years ago. In the mean time our population has increased about 200,000, while juvenile crime has decreased. Especially since 1870, when the existing visiting agency was established by statute, and had its powers greatly enlarged, this decrease has been manifest. On the 1st of October, 1869, there were 97 children under seventeen in the county prisons; a year later there were but 54; in October, 1871, but 33, and on the 1st of last October only 25. At the same time there is at least twice the personal attention given by public officers to the circumstances and temptations of young offenders and neglected children; the moral condition of the whole class from which these culprits come receives more consideration, both from the authorities and the community in general; and the result, as we now see it, is eminently gratifying. The reports of the State Visiting Agent, Mr. Tufts, may well be consulted for further information in regard to the new policy in Massachusetts, and its good effects. This policy is based upon the belief that much of the vice and crime among the young comes from a lack of attention to their individual circumstances, and the want of a good home; and the main object of the State, in its dealings with neglected and culpable children, is to find them good homes. This is done to a much greater extent than formerly, and the persons who receive these children are so held to such a constant responsibility, that the abuse of children placed out from the public establishments is much less than it used to be. The State pays less money, the community is better protected from juvenile crime, the children themselves are better cared for, and their employers are kept from injustice and the oppression which "maketh a wise man mad"—much more a child who has little chance to learn wisdom. While there are still many evils to be corrected, and some that may have come in with the new policy, its general results are everywhere acknowledged to be happy.

The State reformatories.

There are now but two of these: the reform school for boys at Westborough, founded by the late Theodore Lyman, in 1848, and still aided by a portion of his endowment, but mainly supported by the State; and the industrial school for girls, at Lancaster, founded in 1856. The school-ship, or nautical reformatory, established in 1860, was closed in July, 1872, and a few of its boys are still held in confinement at Westborough. The limit of age for admission at Westborough, which used to be fourteen years, is now seventeen, and, on the other hand, fewer young boys are sent thither. The consequence is that the average age of the inmates is considerably increased, and when the board of charities last visited Westborough, (January 14, 1873,) more than three-fifths of the 303 boys present were over fifteen years old. The average age of admission would seem to be now about thirteen and one-half years, or from one to two years greater than formerly. During the year ending October 1, 1872, the whole number at any time in the school was 474; but of these only 90 were new commitments, 43 were received from the school-ship and from Monson, and 69 were returned to the school from various places. The average number during the year was 267; the number

October 1, 1872, was 254; and January 1, 1873, it was 297. The establishment, as for several years past, has a main building where about 200 boys are kept together, under lock and key, and three family houses, in which about 75 boys are generally kept and trusted with greater freedom. There are seven school-rooms, and during most of the year seven schools are kept up. The labor of the boys is about equally divided between the farm of 263 acres and the mechanical work of chair-seating. The cash earnings from labor in 1872 were \$8,113, or about \$30 for each boy. For the current year they are likely to be \$10,000, being \$2,600 for the first quarter of the official year, from October, 1872, to January, 1873. The whole expenditures in 1872 were \$50,534, including \$1,369 paid from the income of the Lyman fund, now amounting to more than \$30,000. From this should be deducted the earnings from labor and sales, amounting to \$8,488, leaving the net cost of supporting 267 boys \$42,046, or about \$3 a week for each boy. Of this net cost, however, the State treasury paid but \$33,375, the sum of \$7,302 being paid by cities and towns for the partial support of their boys, and \$1,369 coming from an invested fund.

The girls' industrial school at Lancaster is conducted wholly on the family system; the 122 girls, making up the average number for 1872, residing in five family houses, each under the charge of a matron, and each containing a school and school-teacher. The whole number at Lancaster during the year was 171; the number, October 1, 1872, was 121; and January 1, 1873, it was 128. Much attention is paid to the school exercises and to religious instruction, less to labor, especially to productive earnings. The age of the pupils increases, as at Westborough, and for similar reasons. In both schools the difficulty of managing and reforming the pupils is thereby increased. A majority of the girls at Lancaster are now persons who have lost their chastity, and a considerable number of them have been prostitutes. In this respect the school has changed for the worse; but it probably renders as great a service as ever to the community. The average age of girls when committed is about fourteen, and they remain for about two years at Lancaster, on an average. A farm of 185 acres is connected with the school, but the girls do little in horticulture or the care of the dairy. For their support in 1872, \$23,987 was drawn from the State treasury, and may be assumed as the cost of the school for the year. The earnings from labor were \$543.63, or nearly \$4.50 for each girl; the net cost for the year was about \$22,776, or \$3.60 a week for each girl. The towns and cities paid \$3,280, however, so that the net cost to the State treasury was about \$19,500. During the present year the net cost of both the State reformatories to the State treasury will probably be but little more than \$50,000, while the cities and towns, which now pay about a sixth part of the expense of the children sent from them, will contribute some \$10,000 more, and the income of invested funds will add \$1,500 more.

Both the State reformatories are managed by boards of trustees, seven at Westborough, and five at Lancaster, appointed by the governor of the State. The other large public reformatory, the Boston house of reformation, which dates back to 1826, is controlled by the city "board of directors for public institutions," who also manage the city prisons. With one of these prisons the house of reformation is connected, being situated on Deer Island, in Boston harbor. The boys in this reformatory are under the same roof with the house-of-industry convicts, but the girls are in a smaller house close by. The

whole number of pupils in a year is about 500, of whom about one-eighth are girls.

The average number in 1872 was 312; and the number January 1, 1873, was about 300 of both sexes. No earnings are separately reported in this reformatory, nor is its annual cost very exactly given; it is probably about \$35,000, or somewhat less than at Westborough. The number of pupils in these three reformatories at the present time is not far from 720; a few years ago it was more than 1,000 in the four large public reformatories then existing. At Lowell and several of the other cities there are small municipal reformatories or truant-schools, to which juvenile offenders are sentenced; the average number of such sentenced children in the whole State is perhaps 100; making above 800 children now held in public reformatories. The "House of the Angel Guardian" is a private Catholic reformatory, with, perhaps, 175 boys in it, but they are not under sentence. It is located at Roxbury, within the city limits of Boston.

Preventive agencies.

The most important means of prevention furnished by the State to check juvenile crime are the State primary school at Monson and the State visiting agency, both dating from 1866, but the latter established by special law only since 1869. This has already been spoken of, and any further information concerning it that may be needed will be found in the annual reports of the board of charities, of which it is a department. The Monson school holds a place of its own among the public establishments of Massachusetts, and, since last June, when it was separated from the almshouse with which it had been joined, to its great disadvantage, has a special claim upon the consideration of persons who have at heart or on their hands the care of poor children. The Monson school is filled with sons and daughters of the poor—children who, if neglected, would grow up to be paupers and criminals, as many of their relatives have. Formerly such children were themselves esteemed paupers and treated as such; now they are by law, and will soon become by custom, the State's wards and pupils, free from any stigma of pauperism, and often outgrowing their hereditary tendencies and the unfortunate associations of their early childhood. The school now occupies exclusively the premises of the former State almshouse, and has a farm of 230 acres. The buildings have been thoroughly repaired and greatly improved; they are now warmed by steam, lighted by gas, supplied with a new laundry, bath-rooms, and other conveniences—none of them too good for the use of these poor children. The number of different pupils during the year 1872 was about 570; the average number 361, the number remaining October 1, 1872, 341, and on January 1, 1873, 357. A little more than a fourth of these pupils are girls. Their average age is between nine and ten, and few are allowed to remain beyond the age of sixteen. They are sent to Monson from the State almshouse, or placed there by the visiting agent, when he believes they do not need the restraints of Westborough or Lancaster, and has no family on his list suitable to receive them. The average attendance in the six school-rooms during the year was 344; the cost of supporting the pupils of the primary school was something more than \$40,000, which was paid wholly from the State treasury. The labor of the pupils does something to diminish the cost of their maintenance, which is about \$2.50 a week for each child; but their cash earnings have been small and are not likely to increase greatly. The superintendent is now about to introduce the

same employment that is pursued at Westborough—chair-seating. It is the rule of the establishment to place the pupils in families, as soon as they can be provided with suitable places, which prevents the long continuance in school of any except the very young or the less desirable children.

The Boston farm school is a private charity, receiving and supporting about one hundred poor children at a time. It has existed nearly forty years in its present form and location, Thompson's Island, near South Boston, and exercises a good influence, so far as its means extend. Its pupils are not under sentence, nor are they boys who have committed offenses, generally speaking. In this respect they resemble the pupils at Monson; but the farm-school boys are of a better stock, physically, mentally, and morally, than those at Monson. There are other private charities, orphan homes, &c., which do in a less degree, and for younger children, what the farm school does.

Discharged prisoners.

There are two societies in Massachusetts which aid discharged prisoners; and both have in former years received State appropriations. The older is the "Prisoners' Aid Society" or "Agency for Discharged Convicts," to which the State in 1871 made an appropriation of \$3,000, the greater part of which went to pay the salary of the agent. The other is a society in aid of women discharged from prison, and maintains the "Temporary Asylum for Discharged Female Prisoners" at Dedham. Both societies are doing a good work on rather a small scale, but more and more each year. Could these agencies be connected, as they are in Ireland, with the government and the school-instruction of the main prisons, more could be done by them to assist the convict in regaining by an honest course the good opinion of society.

Few general remarks have been made in this report, because the whole subject of our penal and reformatory establishments has been frequently discussed in the reports of the board of charities and the prison commissioners. Mr. Edward L. Pierce, secretary of the board, who conveys this paper to the congress, has made himself familiar both with the principles and the details of the subject-matter, and will doubtless answer any questions or make any explanations which may be desired.

10. MICHIGAN.

By Hon. C. I. Walker, chairman of the board of commissioners for the general supervision of penal, pauper, charitable, and reformatory institutions of the State of Michigan.

The State of Michigan ranks eleventh in population of the States of the American Union. It is rapidly growing, having increased the number of its inhabitants more than one-third within the last ten years. It has a fertile soil, is rich in agricultural and mineral wealth, is traversed by a net-work of railroads, and nearly encircled by inland seas, giving it commercial advantages which but few States possess. Its laws are liberal, and bespeak an advanced public sentiment, many of the old forms of jurisprudence, like capital punishment and the grand-jury system, having been abolished, and with favorable results. Its institutions are established upon a broad basis, and wisely adapted for such improvements as time and experience may prove worthy of adoption.

Within the last year crime has decreased within its limits, a result, perhaps, in a great measure due to the increased efficiency of these institutions, and to the use of more effective means for the proper discipline of offenders.

The preventive and penal system of the State for the repression of crime may be summed up in brief as follows :

First. Prevention of the increase of criminals, by provision, through a State institution, for the training and education of truant, vagrant, and dependent children ; they being the great source from whence crime draws recruits to its ranks.

Second. The reform school for juveniles of tender years, who have actually committed crime, and whose guilt has been duly proven.

Third. The jail for the detention of prisoners, arrested and charged with the commission of crime, until they can be tried ; and for the safe keeping of such as have been tried and found guilty, until they can be conveyed to the place of punishment ; and for the imprisonment of petty offenders.

Fourth. The Detroit house of correction, as an intermediate prison or work-house for persons convicted of minor offenses or of grave charges, who give hope of reformation.

Fifth. The state prison for confirmed or dangerous criminals, convicted of high crimes.

[N. B.—At this point, the report goes at some length into a statement of the character and objects of the first of the above-named institutions. A special report on the same subject was also handed in by the Hon. C. D. Randall, secretary and treasurer of the commissioners in charge of the institution, who, as chairman of the joint legislative committee of 1871, on penal, reformatory, and charitable institutions, was chiefly instrumental in originating this very important agency in the prevention of crime. But, as Mr. Brockway, reporting for the committee on prison discipline, (see p. 332,) has fully explained this institution, both statements are omitted here for economy of space.—E. C. W.]

The reform school receives boys between the ages of ten and sixteen years who have been convicted of the commission of crime. They are sent to the school until they reach the age of twenty-one years, but most of them are discharged long before they arrive at their majority, being retained in the institution only an average period of about three years.

Farming has received a large share of attention, and many of the larger boys are mainly employed at it.

The institution is designed to reform rather than to punish those committed to its charge, and religious and secular instruction, as well as labor, are relied upon as prominent agencies in the work of reclamation. Every boy is required to attend school a stated number of hours each week day. Excellent progress is made. There is a fair library and picture gallery attached.

This institution is conducted on the congregate and family system combined. In addition to the large buildings occupied by most of the boys, two "family houses" receive the better class, who are graded into them, and there have more freedom and nearly all the privileges of a good home. They eat at the same table with the family, have large bedrooms, and are treated quite as well as boys generally are on a good farm. The school is doing an excellent work in saving numbers from a life of crime.

The State of Michigan is divided into seventy counties, most of which have jails. The jails contain an average population of about three hundred persons, and for their superintendence and care employ a force of

about one hundred and fifty persons. In construction and appearance they are very unlike. They vary from the cheap log pen to expensive, showy, and imposing edifices, some costing less than one hundred dollars, others fifty or sixty thousand. In the majority of them the safe-keeping of prisoners seems to have been the principal object in their construction, yet most are insecure for the detention of skillful and dangerous criminals. Breaking jail is of frequent occurrence, and without a great deal of watching, the adroit rogue is quite apt to find his way out.

A small cell, destitute of furniture or decent bedding, fronting on a hall or corridor five or six feet in width, without much light or proper means of ventilation, and so constructed as to deprive the occupant of a full supply of that necessity to health, pure air, constitutes the apartment generally provided for a prisoner. In some of them two, and even three, persons are lodged in bunks, one above the other. The air in these cells is frequently foul from the odors of the privy, and the supply of light in many of them is so insufficient that those confined therein can only with difficulty see to read in the day-time. In some of the jails prisoners are locked up in the cells (many of which are damp and musty) all the time, but in the most of them they mingle together promiscuously in the corridor during the day, and are only locked in separate cells at night.

The prisoners have no work, no instruction, nothing to do but to amuse themselves as best they can. Here are to be found in intimate association the old offender and the wayward youth, the former relating his exploits, glorying in his crimes, and inspiring the latter with a desire for similar adventures. The novice is thus made familiar with the "tricks of the trade," and goes forth prepared to operate with all the skill of the accomplished rascal, save experience.

In the best and most expensive jails, as well as in the poorest, this association is of daily occurrence. In the most costly, during the present year, we have witnessed wayward little girls caged up with notorious prostitutes, and truant boys made the companions of degraded and desperate characters. In the very nature of things, imprisonment without labor, and the unrestrained association of offenders of different grades, must have the effect to increase rather than diminish the number of criminals.

While most of our jails are tolerably clean, some of them scrupulously so, there are others that are in a filthy condition—dirt, vermin, and disorder reigning supreme. Scarcely any have bathing facilities, and in some, water for the ordinary purpose of washing the hands and face is not always to be had.

In not a few of the jails prisoners are required to wash and iron their own under garments, or go without clean clothes; and some under such circumstances have gone for months without clean shirts. The effect of confinement under these circumstances is to make men filthy and degraded.

Persons violently insane may frequently be found in our jails for the want of other places for their safe-keeping; and in some of them there is no provision for a separation of the sexes.

Witnesses and debtors, guilty of no crime whatever, are sometimes for months shut up with the vilest felons, and the innocent and the guilty are thus mixed together. Instead of presuming every man innocent until he is duly tried and his guilt proven, our manner of treating men in jail who are awaiting trial seems to presume them guilty and sent to the jail for punishment instead of detention. A large proportion of those commit-

ted are, on examination or trial, acquitted, and thus innocent men merely suspected of crime are thrown into these jails, and caged and cared for in a manner disgraceful to our civilization.

These statements briefly present the true condition of many of our jails, and we think an examination of them must satisfy any fair-minded man that, as generally conducted, they are simply training schools to make adepts in crime. We have yet to learn a single instance where a person has been bettered or reformed by a committal to jail, while, on the other hand, we can point to numbers who we believe have been made worse thereby.

The Detroit house of correction, although a municipal prison, owned and controlled by the city of Detroit, in which the State has no direct interest of ownership, is nevertheless entitled to be ranked among the foremost of our State penal institutions, for the reason that it receives annually from all parts of the State, as well as from the city of Detroit, criminals convicted of misdemeanors, and forms one of the most important links in our whole prison system, being especially adapted for that class of offenders who ought not to be committed to the jails or to the state penitentiary. Besides, this is the only prison that receives to any considerable extent the female convicts of the State. It has acquired an extended reputation, and is recognized throughout the country as a model institution of its kind. With a superintendent who has made the management of prisons not only a study but the practical business of years, devoting all his best energies to the work, this prison has been in many respects a remarkable success.

The house of correction has not only proved self-sustaining, but during its nine years' existence has earned \$103,000 over and above current expenses of every kind.

Prisoners in this institution are principally employed in the manufacture of chairs and cigars. The contract system is not adopted. The superintendent purchases stock, causes it to be made up, and, when manufactured, disposes of the goods.

The discipline is very simple. Obedience, order, and cleanliness are strictly enforced. There are no grades in the male department, and none, unless it be a transfer to the house of shelter, in the female department. Rewards for good conduct are used only to a very limited extent, the privilege of over-work, or a chair, or some other little article of cell-furniture, being about the only stimulus of this kind given to the prisoners. The prison dress is not in use, and flogging with the lash or otherwise has been abolished.

The educational training which this institution gives to its inmates is one of its most distinguishing and excellent features.

The house of shelter, established in connection with the house of correction, to which female prisoners from the latter are transferred for good conduct, is a commodious and well-furnished home, provided with all the comforts and conveniences of a well-to-do family. Here is a company of wayward girls taken from bad influences, forming a little society of their own, and by industry, education, and refining associations, fitting themselves for lives of respectability and usefulness. Each inmate is provided with an ordinary-sized bedroom, fitted with the furniture usually found in a room of this kind. They take their meals together at a table in the dining-hall, covered with a neat table-cloth, and furnished with excellent table ware and napkins. Most of the day is devoted to work, mainly sewing and making linen coats and pantaloons. Singing, music on a parlor organ, evening school and reading, with a weekly evening gathering for conversation and social entertain-

ment, constitute the principal exercises. Culture of this kind, amid such surroundings, cannot fail to be productive of great good in preparing those who receive it for useful home life, and we cannot but regard the house of shelter as one of the best agencies for saving those likely to fall that it has been our province to find.

The success of the Detroit house of correction seems to us not so much due to the adoption of any particular system for the government of its inmates, unless it be the extraordinary efforts in the direction of education, as to the zeal and efficiency of the superintendent. Mr. Brockway is, emphatically, the head of the institution, and every department of it is pervaded with his enthusiasm and inspiration. He has shown himself one of the most active, intelligent, and zealous of the prison men of the country, being among the foremost in the great work of prison reform, and it is matter of deep regret that he is about to sever his connection with the establishment.

The state prison is the principal penal institution of the State, and is nearly as old as the State government, having been established in 1839, three years after the admission of Michigan into the Federal Union. Located at the city of Jackson, in the central part of the State, amid a net-work of railroads, it is convenient and easy of access. The prison grounds embrace some thirty acres of land within the corporate limits of the city, and the prison walls, which have recently been reconstructed in a good and substantial manner, inclose about ten and a half acres.

The system of imprisonment is that known as the congregate or Auburn. The prisoners work in association by day, under the rule of silence, and at night are locked up in cells, some of which have been carpeted and ornamented with pictures in a very tasty manner by the convicts occupying them, thus showing that even behind prison bars men still appreciate and enjoy order and beauty.

The prisoners labor about an average of nine hours each week-day during the year, in workshops within the inclosure. The principal business carried on is the manufacture of furniture, wagons, agricultural implements, cigars, boots and shoes. The labor of the convicts is let to contractors, who, at fixed periods, of which due notice is given, bid and compete for it. The present rates paid for this labor range from 50 to 76 cents per day for each man.

Tasks are assigned to many of the men, which they accomplish before the close of working hours. The remainder of the time they generally spend in idleness.

In their last report the inspectors of the prison say: "The discipline of the prison has been greatly modified and improved within the past year. Kind but decided and firm treatment has been employed as the principal means of control, and we think with decided success. Infractions of the rules have been less frequent, and there has been a gratifying decrease of the necessity for severe punishment. Good order has been maintained and punishment seldom required. No class of men appreciate kindness and humane treatment more than convicts do. Shut out from the world, and deprived of the ordinary privileges of life, they carefully note and remember every little kindness, and we believe are more easily and better governed thereby than by the use of harsher means. We have heard discharged convicts, about to go from the prison, recount the little kindnesses that have been extended to them, and seen them with tears of gratitude in their eyes thank the officers for the interest they had manifested in their welfare. We have made it a point, as far as possible, to ascertain what we could with respect to the conduct of

such as have gone out of the prison, and we are happy to be able to state that the great majority have so conducted themselves as to give the assurance that they will in the future lead better lives. Only a very few have returned to their former practices."

The ordinary and most frequent punishment is the bare cell and short rations; for more flagrant offenses an addition of tying the hands behind the body and fastening them to the cell door. As a last resort, for personal violence or a deliberate outrage, the lash is still held in reserve, although the instances for its use are seldom found necessary. Whenever convicts have, or conceive that they have, cause of complaint against officers or any free men, they are always at liberty to bring their complaint to the agent.

A system of rewards has been devised and partly put in effect, so that now, at the end of each month, the convict who has conformed to the rules of the prison receives a card, as evidence of good behavior. Officers say that it is astonishing to see how the men prize these cards, treasuring them up, or sending them away to their families; and that the effect of these little rewards is excellent in controlling the prisoners and stimulating them to good conduct. Again, some of the old features of prison life, tending to destroy the self-respect of the imprisoned, have been removed, and the change seems to work well. Thus the rule requiring the men to labor with their eyes constantly upon their work has been modified, and there is no longer that downcast, "hang-dog" expression which formerly seemed to be peculiar to each convict.

There has also been greater infusion of educational agencies. An hour on each Sabbath is now devoted to secular instruction, and numbers of convicts who came into the prison unable to read or write, through the training of this school, have acquired these primary elements of education. Interesting lectures and readings are more frequent than formerly, and many of the men, stimulated by the desire thus created for good reading, have voluntarily given up the use of tobacco for the privilege of becoming regular subscribers to some one of our leading monthly magazines. Twice a week, after dinner, the agent selects and reads for fifteen minutes to the prisoners in the dining-hall some interesting and instructive piece.

The prison continues the practice which it some years ago inaugurated, of giving special privileges to its prisoners on public holidays. The custom is believed to be beneficial, making the convict more cheerful, and impressing him with a conviction that an interest is still felt in his welfare. An excellent dinner and short addresses constitute the order of the day on these occasions. Of the effect of the observance of these holidays the agent says: "I am satisfied that in the manner we have conducted them they have in no way impaired or relaxed the general discipline, while, on the contrary, the presence of good men and women, reading, talking, and singing, assures them they are not entirely cut off from all human sympathy. The whole tendency of these hospitalities is to engender and enliven the kindlier feelings and sympathies." For several years the prison has been self-supporting, paying by its earnings all its current expenses.

The public mind of the State is beginning to manifest more interest in the work for which this congress has assembled. Men and women within our borders are helping to create an improved system of prison discipline, worthy of our civilization. We have reason to anticipate favorable legislation in relation to many of the topics suggested. And it is an especial cause of congratulation that our efficient governor is in full and hearty sympathy with us in the cause of prison reform, and in

the improved care demanded for all the wards of the State, and we have strong faith that the good work will go on until these desirable results are fully accomplished.

11. MINNESOTA.

By Professor William F. Phelps, President of the State Normal School.

Minnesota was admitted into the Union in May, 1858. Hence, its institutions of every kind must be regarded as yet in their infancy. None but those who have participated in the struggle can have any adequate conception of the difficulties and embarrassments attending the efforts to build up these institutions on just principles in frontier States, composed of heterogeneous elements gathered from almost every quarter of the globe. Of course it is expected that in new communities man's earliest efforts must be put forth for the supply of his material wants, and for his protection against the destructive tendencies of natural forces. But he also soon finds himself compelled to guard against the ravages of the rapacious and vindictive passions of his fellow-men. Hence penal institutions are, unfortunately, among the *prime necessities* of a State, while yet its resources are undeveloped and the views of its people are as diverse as their origin and the circumstances under which their opinions have been formed. These conditions inevitably lead to inadequate, conflicting, and unwise legislation, rendering it quite impossible to provide those comprehensive and far-sighted arrangements so necessary to secure the reformation as well as the proper restraint of the vicious and the criminal at a time when, above all others, such measures would prove the most potent in tempering the spirit and shaping the policy of the institutions, which are to be as enduring as the State, and which are, indeed, to become a part of the State itself.

Population and commanding position.

The population of Minnesota at the present time is 527,500, or more than three times as great as in 1860. It is situated on that central line which is nearly equidistant from the two great oceans. The head of the "unsalted sea," which is also the beginning of the chain of lakes reaching through the Saint Lawrence to the Atlantic, and the source of the Father of Waters, connecting it with the Mexican Gulf, are alike within its boundaries. Through the Mississippi it stretches forth its hands to the tropical, while through the Red River of the North and its connections it reaches to the Arctic zone. The Northern Pacific Railroad, opening up the shortest and easiest pathway "across the continent," has its eastern terminus, with its numerous branches, within the borders of the State, whose area is more than 83,000 square miles, and whose ample domain is capable of sustaining a population equal to that of half of the entire United States at the present time. The Canadian Pacific Railway, whose construction will undoubtedly be commenced near our northern frontier, and be vigorously prosecuted during the present year, will have its connections with the vast system already spreading its iron net-work over our prairies, and thus making our territory teem with the commercial life of two hemispheres. These facts have a tendency to give to the State a prominence and an importance that are keenly appreciated by its leading minds, and by those who,

while struggling to shape the policy of its institutions, are laying the foundations of a future whose influence must be little short of illimitable.

The institutions of Minnesota.

The institutions at present existing, which bear upon crime and are under the immediate care of the State, are: I. The educational, or preventive. II. The benevolent, or humane. III. The penal and reformatory.

I. *The Educational Institutions* consist: 1. Of the State University at Saint Anthony, with 250 pupils, and maintained at a cost to the State during the past year of \$21,000. 2. Of three State normal schools for the special training of teachers, located respectively at Winona, Mankato, and Saint Cloud, and giving instruction during the year 1872 to more than 500 embryo teachers. The current expenses of these seminaries defrayed by the State last year were \$25,000. For the present year they will amount to \$30,000. The amount expended upon buildings already erected and in progress is more than \$200,000. 3. Of 3,000 common schools, scattered throughout all the organized townships, including numerous high schools in the cities, which have already attained a standard of commanding excellence. The number instructed in these schools during the past year was 120,352, at a cost of about \$1,000,000; while the number totally uninstructed and left to recruit the "ignoble army" of illiterates in the State, was 59,668. The productive school fund now amounts to \$2,780,559, being the fifth in magnitude in this country, with six-sevenths of the "school-lands" from which the fund is derived are yet unsold. The increase in the number of common schools last year was about 200.

These facts are brought forward here on account of the vital relations which exist between education and crime, between the preventive and the penal institutions of a State—relations which, in all our discussions of the latter, should be distinctly recognized. A *true education* is the surest preventive of crime, and no *reformation* can be effective or permanent which does not address itself to the *enduring soul* of the fallen being.

II. *The Benevolent Institutions.*—These comprise the hospital for the insane at Saint Peter, the institute for the deaf and dumb and the blind at Faribault, and the soldiers' orphans' home at Winona. These institutions are all projected and supported on the most liberal scale, and are conducted according to the latest developments in the medical and educational sciences.

III. *The Penal and Reformatory Institutions*, comprising: 1. The state prison at Stillwater, on Lake Saint Croix. 2. The State reform school for both sexes, near Saint Paul. 3. The jails established and supported under county supervision.

1. *The state prison.*

Location.—The buildings for this institution are located at the mouth of a short ravine, between two high and deep bluffs fronting on the lake, and running back to a point of junction with the main ridge of which the bluffs are spurs. This ravine comprises about four acres of ground. The foundations of the buildings rest upon piles driven into the marshy soil beneath. The sum of \$125,000 has been expended upon the build-

ings, and \$40,000 more will be used during the coming year in improvements.

History.—This prison was established and located in 1858, the year in which the State emerged from its territorial condition. There were at that time but three "prominent points" in the State—Saint Paul, Saint Anthony, and Stillwater. Saint Paul had the capital; Saint Anthony secured the university, and Stillwater the state prison. In those early days the location of State institutions was controlled less by public than by private considerations. The selection of the grounds for the state prison was singularly unfortunate.

Buildings and grounds.—There are but two permanent buildings occupied by the prison. They are located on opposite sides of the inclosed space near the base of the bluffs forming the ravine. The main prison building is on the left of the space inclosed, and is about 210 feet long by 40 in width. This contains the cells, (a portion of which extend to the third story,) the domestic department of the institution, the officers' quarters, and the family of the steward; the cells themselves being in the rear. It is built of limestone, and is very substantial and neat in appearance. The other building, which is on the right, and further to the rear, is also of stone, and two stories high, with basement. This contains the workshops, store-rooms, and engine and boiler rooms. There is a wall along the front of the premises, and the three other sides are inclosed by a plank fence some 12 or 15 feet high, flanked by a walk for the sentries, and surmounted by guard-houses for those officers when on duty. A sewer, as yet quite inadequate to meet the necessities of the prison, passes through the grounds and discharges into the lake in front. The cells are ventilated by small tubes connecting with shafts passing through the roof.

System of management.—The associate system of labor is employed. The convicts work in groups in the several shops under the supervision of an overseer or foreman, and a guard. In all other respects the cellular system is adopted. The food is taken exclusively in the cells, and the men are constantly confined, excepting during the hours allotted to labor.

General administration.—The prison is under the general supervision of a board of three inspectors appointed by the governor, by and with the advice and consent of the senate, for three years, one member retiring each year. The warden is appointed in the same manner. All the subordinate officers are appointed by the warden, excepting the chaplain and the physician, who are selected by the inspectors. As is usual in such cases, political considerations influence more or less the selection of these officers. It is but just, however, to say that all the officers of the institution have been chosen with excellent discrimination and good judgment.

System of labor.—The contract system of labor prevails in the prison. The existing contract extends through a period of nine years, the price being 45 cents per day for each man employed. Ten per cent. of the convicts are reserved for the uses of the institution in its domestic department. The branches of industry pursued are few and simple, being limited principally to the production of wooden ware, barrels, window-sashes, doors, and a small amount of cabinet and carpenter work. The average duration of a day's work is ten and one-half hours throughout the year, although in the winter season only eight and one-half hours are occupied. In cases of over-work, which are, however, rare, the convict is allowed to participate in his earnings.

Discipline.—The discipline is firm yet mild and eminently humane.

As a general rule, talking is prohibited among the convicts, except in cases where it is necessary in carrying forward the work. The officers exercise a kind and paternal influence over the unfortunate men under their charge. Cheerfulness prevails to a remarkable degree among the convicts. They appear in this respect more like laborers working for wages and enjoying the fruits of their toil than like men convicted of crime and undergoing the deprivations of penal servitude. There seems to be an entire absence of that feeling of sullen depression so characteristic of convicts submitting to the rigors of an iron rule.

Punishments.—Corporal inflictions are never resorted to. For the graver offenses, confinement on bread and water until penitence is secured is the principal reliance. The ball and chain, as a penalty for attempts to escape, is imposed upon the more incorrigible. But all those forms of punishment calculated to inflict bodily torture or create a sense of indignity are entirely discountenanced and avoided.

Incentives to good conduct.—Under a law of the legislature, passed in 1867, a convict may abridge the term of his sentence by exemplary conduct. By the terms of this act two days may be deducted for the first month of good behavior, four days for the second, and six days for each succeeding month, provided that the right to such deductions is not forfeited by subsequent misconduct. Restoration to citizenship through the pardoning power follows a continuous course of unexceptional behavior.

Pardons.—The governor of the State has the authority to pardon a criminal before the expiration of his term of sentence. This power is sometimes exercised on the recommendation of the warden for good conduct, sometimes through petitions of influential citizens, pleading mitigating circumstances, and the like. The commanding general of the department of Dakota has occasionally pardoned prisoners incarcerated for military offenses, and the President of the United States exercises the same power in behalf of offenders against the laws of the General Government.

Instruction.—No systematic instruction, either secular or religious, is imparted to the prisoners as a whole, except during one hour on Sunday, when services are held in the chapel of the institution. A small library is provided for the men, and they use it freely, being encouraged to do so by their thoughtful and humane officers, who manifest the warmest interest in the welfare of their charge.

Sanitary condition.—Considering the location of the prison, its peculiar surroundings, and the many inconveniences to which it is compelled to submit, the health of the convicts is quite remarkable. This is no doubt accounted for by the extreme care of their officers in preserving the utmost cleanliness in every part of the buildings occupied. The food is of the best quality, carefully cooked, and regularly served, with an abundance for every man according to his necessities. The variety observed in providing the meals through the week is very judicious and well calculated to preserve a healthful tone in the digestive organs. Bathing is required as a regular duty, and everything that conduces to health is carefully regarded in the administration of the affairs of the prison. The Fourth of July, Thanksgiving day, and Christmas, are "legal holidays" in this institution. On these days the convicts are served with as good a dinner as any first-class hotel can provide. They are allowed the freedom of the prison. They visit each other in their cells, converse, sing, and enjoy a wholesome social reunion. Considering the serious lack of material aids and of the ordinary conveniences of such places, this prison is, in a generous sense, a model of wise,

humane, and efficient management. Time and a better appreciation of the true ends of penal discipline will do much, it is to be hoped, to mitigate the evils arising from the unfortunate circumstances of its location and earlier history.

The total cost of maintaining the prison, in 1872, was \$30,485; the earnings from convict labor were \$14,973; excess of expenditure over earnings, \$15,512; cost per prisoner, \$168.81.

II. *State Reform School*.—This institution was established and opened under State auspices, in January, 1863. It occupies sixty-three acres of ground about three miles from the business portion of Saint Paul, on the main road to Minneapolis. It is about seven miles from the latter city and is located on a commanding eminence overlooking a large extent of country, in an eminently healthful situation.

The total cost of buildings to the present time has been \$30,000; the total number of boys committed to the institution, 180; the total number of girls, 15. The sexes are entirely separated from each other. The annual current expenses are about \$20,000.

As far as possible the "family plan" has been adopted in the management of the institution. As only the main building has yet been erected, this plan cannot be fully carried out in practice. The inmates of the institution are brought under such influences as prevail in a well-governed and well-regulated home, with good instruction and a firm though kind and paternal discipline. The rewards and punishments are of the *natural kind* in use in all well-managed homes. The "lock-up" has never been used; all the professional appliances of prison discipline are scrupulously avoided.

The inmates are well fed, well clothed, well instructed, and well disciplined. They are allowed an abundance of play, and yet they are required to work systematically and to study attentively. In the words of the very efficient superintendent, Rev. J. G. Riheldaffer, "*school-room instruction is the first great work of the institution*. We do not hold these children for the present pecuniary advantage of the State, but for *compulsory education*, and for a preparation for the work of life." These are noble words, and they should form the key-note to the management of every reformatory and penal institution.

A large garden of fruits and vegetables is cultivated, and many of the boys are required to labor in it during the summer. A considerable number are employed in the domestic department of the institution. In addition to these employments, there is a tin-shop in which the boys in squads of twelve are learning the tinner's trade; a shoe-shop, with every facility for learning that trade; and a tailor's shop, in which they learn to make and repair their own clothing.

To these educational, domestic, and industrial means are superadded religious instruction in which our obligations to God and to our fellow-men, and our accountability to God together with the noble rewards which attend a life of virtue and the fearful penalties of a life of vice and crime, are held up as the incentives to a patient continuance in well-doing.

Considering the youth of this institution and of the State which fosters it, with the yet stunted means at its disposal, it is a decided success. The boys who have been discharged from it are for the most part conducting themselves in such a manner as fully to vindicate the wisdom of the means employed to save them from a life of crime, and make them honest, upright, worthy citizens.

III. *County jails*.—With very few exceptions these institutions in this State are of the most primitive sort and scarcely fit for the accom-

modation of the beasts of the field. This is an apparently inevitable consequence of the peculiar state of things existing in a new country, with a yet meager population, and with resources only partially developed.

In several of the larger cities—Saint Paul, Stillwater, Winona, Hastings, and Rochester—very creditable buildings have been erected for the uses of the jails in their respective counties. In many cases, however, the jail is but a meager appendage to a splendid court-house, a single room being supplied with cells for the confinement of persons accused of crime and awaiting trial.

At Winona, however, a large and commodious building has been erected for the exclusive occupancy of the county jail, the sheriff, and his under-officers. This building is of stone, is finely located, and is really a model of its kind. The cell-block is two stories in height, and the cells are entirely of wrought iron placed back to back in the center of the prison, and are surrounded by a spacious and airy corridor, paved with heavy boiler-iron. It is kept scrupulously neat in all respects, while escape from it seems a physical impossibility.

12. MISSISSIPPI.

By General B. B. Eggleston, president of the board of inspectors of the state prison.

The management of the state prison has, under the provisions of an act passed by the legislature entitled "An act for the regulation, control and support of the penitentiary," approved March 28, 1872, undergone a marked change for the better in almost every respect, and notably has this been the case in the treatment of the convicts. Hitherto these unfortunate outcasts have not received that care and attention for which humanitarians in this country and in Europe (whose efforts are now happily about to be crowned with success) have so long and persistently labored. Up to the 3d day of last May, when the present superintendent, Mr. C. W. Loomis, took charge of the prison, unnecessarily cruel punishments, which might justly be termed the relics of a barbarous age, still prevailed. But the people of our State have not been unmoved spectators of the universal movement in the direction of prison reform, and the public sentiment was significantly expressed by the legislature in the act above referred to, whereby corporal and every other species of punishment, not tending to enforce the rules and regulations necessary to prison government, were abolished. And this is better shown by reference to the thirteenth section of the act, which reads as follows:

That hereafter the head of no female convict shall be shorn, and no punishment by *blows* or *stripes* shall be inflicted, under any circumstances whatever, upon convicts of either sex; but it shall be the duty of the inspector to prescribe such punishment, in the form of solitary confinement in a dark cell, or such other mode as they may deem fit and expedient; and it shall be the duty of the superintendent to keep a merit and demerit roll of the conduct of the convicts, and he shall, from time to time, report the same to the governor, who shall shorten the term of service of any convict at the rate of three days for each month of said term, whenever said merit-roll shall indicate that said convict has been guilty of no violation of the rules of the penitentiary.

Under the above and other provisions of law, and in the exercise of a wise discretion, the superintendent has succeeded in transforming the convicts, who came under his supervision morose and discontented, into a remarkably orderly class of men.

They seem now to feel something of that self-respect which is so invaluable in law-abiding communities. Every encouragement consistent with prison regulations is afforded to develop the best qualities of their nature, and to cultivate in them moral principles which will hereafter tend to make them better and more useful citizens.

The superintendent has, as far as possible, caused them to feel that they are governing themselves, rather than being slavishly governed, and the result is apparent in the remarkable fact that, out of over four hundred convicts, he has found it necessary, under the present regulations, to punish only two.

Religious instruction is regularly administered to them, and they attend divine worship in their chapel every Sabbath with apparent willingness, and some show of devotion; they also attend a well-managed Sabbath-school, established for them within the prison; they have the advantage of literary recreation in the use of a library, maintained by a fee of 25 cents for admission of visitors to the institution; and once a year, on Christmas day, they are allowed the use of the prison hall, and free communication with one another.

The superintendent has also shown a very commendable zeal in another important direction, viz, in the distribution and apportionment of labor. Making himself thoroughly acquainted with the habits and dispositions of the convicts, he assigned to them that kind of labor to which, from their mental and physical capacities, they were best adapted; and in no case has an undue amount of labor been given to a man as a punishment, the superintendent humanely claiming the object of a criminal's incarceration to be a reformation of his character rather than a vindictive punishment of his crime.

By these means he has acquired an influence over the heads and hearts of these unfortunates, which has enabled him in his first annual report to the board of inspectors to exhibit a greater amount and better quality of work in every department of labor than has marked the close of any previous year. He has encouraged among them a spirit of emulation, and the result has been most satisfactory. To use his own words, "The most contented and cheerful prisoners we have are those who evince the greatest interest in their work, and endeavor to complete what they have to do in the most expeditious and workmanlike manner."

The above remarks apply only to prisoners within the walls of the penitentiary, and who are, consequently, under the immediate personal supervision of the superintendent. There is another class of prisoners referred to in his report as "prisoners working on railroads." Owing to want of accommodation for all the prisoners in the present building, it has been, for the past few years, found necessary, under the authority of law, to lease the labor of the surplus convicts without the prison walls.

They have been employed on plantations and in the construction of railroads. For their protection, the most jealous restrictions have been placed upon the lessees; nevertheless, the position of this particular class has been a source of much public uneasiness. The legislature, during its last session, though it inaugurated many wholesome reforms and abolished many objectionable features in the prison management, did not feel that it could make any changes for the better in this direction, except prospectively. It made provision for the purchase of a site for, and the construction of, a new building, which will, when completed, afford ample accommodation for all our convicts within its walls. The board of inspectors show a keen appreciation of this unsatisfactory

mode of employing convicts' labor, as will be seen by reference to their first annual report to the governor. The superintendent himself, in his report to the inspectors, in which he describes at length the condition of this class of convicts and their removal from the ameliorating influences which he is enabled to throw around those within the walls, thus gives expression to his very great anxiety on this subject :

But I submit that it is prejudicial to the best interests of the prisoners ; and that the very intent of the law itself is defeated when they are thus employed. The object in sending a prisoner to the penitentiary is, first, to prevent crime ; and, secondly, the reformation of the criminal. It is the imperative duty of those having prisoners in charge to labor to effect this reformation ; and it is a matter of impossibility to enforce the same discipline outside the prison walls which is enforced within.

No doubt these earnest appeals in behalf of this class of convicts will have their legitimate effect in inducing the legislature to hasten the work of completing the new prison building. It is believed that the legislature will, at the same time, testify its appreciation of the results of partial improvement by the adoption, at the earliest possible moment, of a thorough and complete system of prison reform.

13. MISSOURI.

[No formal report was received from this State, but the two delegates, Mr. Miller and General Miner, commissioned by the governor to represent Missouri in the Congress of Baltimore, learning this fact, handed in the following memorandum :]

Having heard from the corresponding secretary of the National Prison Association that he had received no report on the penal institutions of Missouri, we, who are delegates from that State to this congress, beg leave to submit the following on the present condition of such institutions, with the regret that it must, of necessity, be so meager and incomplete.

Missouri has only one penitentiary, which is located at Jefferson City. It now contains some nine hundred convicts, of whom about twenty-five are women. The inspectors are State officers, consisting of the auditor, treasurer, and attorney-general, who hold their position *ex-officio*.

Under the earnest recommendations of the governor and the board of guardians, we are confident that our penitentiary will be placed, by the legislature now in session, on a higher ground of reform to the convict and of usefulness to the State. This institution has been made, since its erection in 1836, the theater of experiments of almost every modern system of management. The State itself has undertaken the management of its labor as well as its discipline. It has been leased out for a term of years to a company, with full control given to them over the prisoners. At present the labor of the men is hired to various individuals and for varied industrial pursuits. Under all these modes of management, the institution has been a source of heavy expense to the State ; it has never been self-sustaining.

The system of management is the congregate, and every privilege is allowed to the inmates consistent with the public safety. The principle of kindness, as far as possible, is the present rule of action. The lash is abolished and the striped garments will be only retained, it is hoped, until some exterior walls now in process of construction shall be finished. The labor of the convicts is hired at 40 cents a day.

The education of the convicts is at present utterly neglected. Yet we

anticipate, among the coming improvements, a system of instruction that will provide for a teacher-in-chief, with the power of taking from the convicts a suitable number of competent assistants ; and that ample time will be given to impart to all illiterate convicts a fair common-school education.

From the experiments made, we are convinced that, for the class of convicts now in the Missouri penitentiary, the congregate system is by far the best. We cannot commend the adoption of any plan of management that, by a coercive system of silence and unceasing labor, for hours, on one branch of industry, in one position, and with downcast eye, tends to crush out the manhood of the convict, and which, by forcing his thoughts continually in the direction of his own sufferings, is calculated to breed feelings of revenge toward the State, and of hatred toward his keepers. Our observation and experience confirm us in the belief that the social nature of the prisoner should be exercised and developed under proper guidance, and that, so far from any evil resulting, this plan may be made a powerful element of individual reformation.

The system of county jails in our State is one that requires many changes. We except the new jail of Saint Louis, which, in all the elements of a good prison, has scarcely its superior in the United States.

The city of Saint Louis has a house of refuge and a work-house ; but the State itself has no reformatory institutions, no industrial schools, no houses of industry and correction. We earnestly hope and believe that the question of organizing these essential agencies in a system for the prevention and repression of crime will receive the early attention and favorable action of the legislature.

14. NEBRASKA.

By Rev. J. W. Snowden, Missionary A. S. S. Union, and acting chaplain of the State penitentiary.

The great aim here is to educate the head and heart, reform and elevate, making the prisoners feel that they can regain what they have lost, and be prepared, socially, morally, and religiously, to assume citizenship, and enter anew upon the honorable duties of free life.

The discipline, though firm, has been tempered with much mildness. The Bible has been publicly opened and studied, the word of God is preached every Sabbath. From the prison vaults songs of Zion ascend daily. Three nights in the week a common school is conducted with marked success, in which Indians, Africans, and whites are taught to read and write. Instructive lectures are, from time to time, delivered to the prisoners. A literary society has been formed and meets weekly. The convicts are also supplied with books, and with religious and literary papers. Of forty-eight prisoners discharged within the past eighteen months, only one was unable to read and write. Several have given unmistakable evidence that they have passed from death unto life, and their reformation is complete.

Mr. Henry C. Campbell, the present warden, is a humane and efficient officer. May God more abundantly bless the great work of reclaiming and reforming the fallen and guilty.

15. NEW HAMPSHIRE.

By Rev. Wm. Clark, D. D., formerly chairman of the joint legislative committee on prisons.

New Hampshire contains a population of 313,300 souls; an area of 9,280 square miles. Its inhabitants are mainly Americans by birth, and descendants of the Puritans. In late years the enlargement of manufacturing enterprises, and the development of our extensive water-power have brought in a considerable foreign element. In general education, morals, good order, obedience to law, and industry, the State will compare favorably with any of her sister States.

Our penal institutions are the state prison at Concord, and our ten county jails, one in each county.

Refractory prisoners are generally subdued and brought to obedience by kind, yet firm, moral treatment; where this fails, confinement in dark cells, with diminution of food, is generally effective. Prison inmates are men, notwithstanding their violation of law and incarceration; self-respect they have still, to which, if appeal be generously made, their dormant manhood will re-appear, and they often show themselves possessed of noble qualities. This is the kind of discipline which, in the main, characterizes the government of the New Hampshire state prison, and which, its officers testify, renders its management comparatively easy. The commutation law, which enables prisoners by good conduct to shorten their terms of imprisonment, has proved an effective agent of discipline and reformation.

One of the results of our system of universal education in New Hampshire is, that but a comparatively small number of the inmates of our state prison are unable, on committal, to read and write. Of the eighty prisoners confined April 30, 1872, seventy-two could read and write; six could read, but not write; two only could neither read nor write. The chaplain maintains a school for such notwithstanding the smallness of the number.

There is a good library belonging to the prison containing about fifteen hundred volumes, mostly valuable books, which are much read by the prisoners. The legislature appropriates \$100 per annum to keep up and increase the library.

The prison enjoys the constant labors of a faithful and experienced chaplain. At 9 a. m. on the Sabbath he preaches in the chapel of the prison building, when all the male prisoners are required to be present. At 10 he holds religious services with the female convicts, which are followed by a service in the hospital. At 1.30 p. m. a Sabbath-school is held in the female department. At 3.45 a similar service is conducted in the male division by prison officers, assisted by Christian gentlemen of different religious denominations, who volunteer their services for this work. The remainder of the Sabbath the chaplain devotes to private conversation with the prisoners in their cells. Attendance on the Sabbath-school is not compulsory; but more than half the prisoners attend voluntarily. A convicts' prayer-meeting is held every Wednesday evening, which is well attended by the prisoners, who take part in the exercises of prayer and singing, with propriety of demeanor, and with much apparent, and it may be hoped sincere, devotion. At any rate, its influence upon the tone of the conduct of the prisoners is indubitably and decidedly good.

The only industry carried on at present is that of the manufacture of cabinet-ware. The labor is let to a contractor at 95 cents a day per man. The annual profit exceeds the expenses. The expenditures for

the year ending April 30, 1872, were \$14,429.85; the earnings \$19,930.88; a net gain to the State of \$5,501.03.

The system is that of congregate, as distinguished from cellular, imprisonment.

Perfect silence is maintained among the prisoners while at work, and, indeed, at all other times; nor are they permitted to communicate by signs more than by words.

The prison is well ventilated and kept clean and wholesome. The cells and halls are swept daily, and often thoroughly washed. The clothing and bedding are comfortable. The food is ample, varied, well prepared, palatable, and nourishing, as the generally hale appearance of the prisoners clearly shows. The physician daily visits the prison, taking a kindly care of the sick and of chronic invalids. Mortality among prisoners is probably greater than among the same number of law-abiding persons, for the reason that many convicts enter prison with constitutions impaired by vice and crime. The deaths among the 1,522 inmates of the prison during the sixty years of its existence have been 102, or at the rate of $1\frac{1}{3}$ per year on the average.

On the whole, the government and management of our state prison, in its several departments, will compare, I think, favorably with most institutions of the kind in our country. The prison building might be improved; the dormitories are too small; and other architectural deficiencies are patent. But considering that the prison was erected two generations back, its arrangements and conveniences are quite tolerable. Its government is firm, but humane. The physical and moral welfare of its unfortunate inmates is kindly regarded and, to a good degree, promoted. The institution is creditable to the character of the State.

Our county jails are very far from being models. The jail system stands in need of radical reforms.

The reform school, established by the State some fifteen years ago, near the city of Manchester, was designed as a home and school for idle, vagrant, and vicious children. There was found to be a rapidly increasing number of children of both sexes in our manufacturing towns, especially the children of foreigners, who were growing up in idleness, immorality, vice, and crime, and who, unless checked and reformed, would become dangerous members of the community, and soon be candidates for the state prison. To save the children and train them to honest industry, the reform school was established, and it has, in some good degree, accomplished the hoped-for objects.

The inmates of the school make good, many of them rapid, improvement in the ordinary branches of common education; but their moral improvement is not so encouraging. This should not be cause of surprise, as most of them had previously lived under evil influences and formed vicious habits. Still, the larger part leave the school improved in character and become useful members of society.

A farm is connected with the school, on which all the boys work, more or less. In the winter they are employed to some extent in caning chair-seats. The girls are taught sewing, house-work, &c. The managers feel that there should be introduced into the establishment some of the usual trades, believing that such a measure would be for the best good of the inmates.

A great desideratum in the reform school is a chaplain, who would devote himself wholly to the moral and religious instruction and training of the scholars.

A society to aid discharged convicts was formed a few years since in

the State, but as yet is small in membership and means, and has not acquired a large influence, or accomplished very important results.

16. NEW JERSEY.

By John F. Hageman, Esq.

The State of New Jersey is giving increased attention to the science of penal law and prison reform. It has made more advance within the last ten years than in the preceding half century. It is, however, only a follower and not a leader in this noble cause, which is attracting the attention of civilized nations as the most inviting field of Christian philanthropy—the most important branch of social science. It is not that the people of New Jersey are less philanthropic and humane than their fellow-citizens of other States that they have given such a tardy support to this great movement; nor is it that they occupy a lower grade than others in education, religion, and public wealth.

The State claims now to be ranked among the foremost States of the Union in its system of public schools. In addition to this and its prosperous normal school, it is distinguished for its several colleges and seminaries, literary, scientific, and theological, of world-wide fame and influence, and for its large number of Christian churches and charitable institutions, all creating an enlightened and Christian public sentiment throughout the State. And no State is in a better financial condition and better able to respond to the calls of reform measures than New Jersey.

If our people have been apathetic, and have lagged behind in this reform movement, it may have been due, in some measure, to their strong confidence in the unsullied character of the judiciary of the State, to which they have intrusted the enforcement of its penal laws for the repression of crime. With no corrupt connivance between the courts and criminals, they have been assured that the machinery of their legal tribunals are in the hands of pure, honest, and learned officials. It may be that with such confidence in the bench and bar of the State, for the due punishment of crime, they may have become too indifferent to that feature of punishment which relates to the reformation of the convict, as well as toward juvenile reformatories for the prevention of crime.

But the philanthropic heart and conscience of New Jersey have been touched by the appeals and labors of prison-discipline associations of other States, and it is hoped that henceforth vigorous and co-operative efforts will be made to win the prisoner back to virtue, which is not a hopeless work. The late Dr. Benjamin Rush of Philadelphia, before the Society for Promoting Political Inquiries, convened at the house of Benjamin Franklin, in 1787, in speaking of the effects of public punishment, said: "I have no more doubt of every crime having its cure in moral and physical influence than I have of the efficacy of the Peruvian bark in curing the intermittent fever. The only difficulty is to find out the proper remedy or remedies for particular vices."

The public institutions of the State which are strictly penal are: 1. The state prison; 2. The county jail. And those which are chiefly reformatory and preventive are: 3. The State Reform School for Juvenile Offenders; 4. The State Industrial School for Girls.

I.—*The state prison.*

This is situated near the Delaware, in South Trenton. It was built in 1836, in place of the old Lamberton prison. It was designed to carry out the solitary system, which was then approved, but which has been since abandoned as injurious to health and mind, expensive and ill-adapted to the reformation of the prisoners. The building has been enlarged from time to time by additional wings, one of which, known as the east wing, has just been completed, with 170 cells, constructed and finished upon modern, reformatory principles, as to light, ventilation, cleanliness, and security. The whole number of cells in the prison is 522; all are lighted with gas at night, as are also the public rooms and halls. The whole building is warmed by steam, and under its present careful management it is not subject to the charge of being utterly unfit for a prison, but it really contains all the elements of a suitable building for such purpose. The average number of prisoners during the past year was 527.

General administration.—By recent legislation the government of the prison has been improved. In 1869 the prison act was revised and amended, and the office of supervisor was created, the appointment to be made by the governor, chancellor, chief justice, and attorney-general of the State, for the term of three years, with a salary of \$4,000 a year. This officer, and the comptroller and treasurer of the State, constitute a board of supervisors. The keeper and the five inspectors are chosen annually by the legislature; the constitution requires this; the keeper receives a salary of \$4,000, and appoints his deputies. The judges of the supreme court and court of errors, and the members of the legislature, constitute a board of visitors. The annual election of the keeper and inspectors by the legislature destroys the stability of the prison administration. Politics will, in this way, interfere with the appointment, and frequent and uncertain changes in the offices of keeper and inspectors are hurtful to the good management of the institution. There is no central power supervising and directing the entire penal system of the State. Such a power, having charge of all the penal and reformatory institutions of the Commonwealth, with a new classification of crimes and the establishment of intermediate prisons, would be of great utility.

Prison industries.—The present law requires every convict to be kept at hard labor every day except Sundays, if able to work. The original plan of private labor in cells has been superseded by ample workshops, erected in connection with the prison, where the prisoners work together in silence, and take their meals at a common table, also in silence, having teachers and overseers in their work. Their labor is done by contract, which is not favorable to the labors of the moral instructor. But the system works well financially thus far. The convicts are happier and more obedient, under such a system of labor, than the former one, and their earnings amount to more than enough to maintain them in prison. The State has received this year about \$28,000 from the surplus of their earnings after taking out the cost of their maintenance. Their earnings the past year amounted to \$80,892.99, and their expenses were \$52,414.52, exclusive of the salaries of officers. It may soon become wholly self-sustaining.

Discipline.—The treatment of prisoners has become kind and humane. No corporeal punishment is allowed by law. The use of the parti-colored dress is retained to prevent the escape of prisoners from the workshops, which are not yet as secure as they should be. The order among

the prisoners is improved by the system of work and the reformatory efforts bearing upon them. Kind treatment is not lost upon them.

Religious and secular instruction.—This is an important department of duty. As far back as 1827, in the old Lamberton prison, the students of the Princeton Theological Seminary, under the inspiration of the Boston Prison Discipline Society, visited that prison every Sunday to teach the Bible and to preach to the prisoners, and the legislature favored it and directed rooms to be provided in the prison for that purpose. The law has, for a great many years, authorized a supply of the Bible and other books to the prisoners, and also a suitable person to give them religious instruction. The moral instructor is now appointed by the governor and supervisors, with a salary of \$1,000 a year, and he is required to devote all his time to his office. He preaches every Sabbath in each of the four halls of the prison and recites the Moral Law, the Apostolic Creed, and the Lord's Prayer. The Bible and religious papers and books are distributed among the convicts, and are gladly received and read by many of them.

The moral instructor and the other officers of the prison concur in an appeal for a chapel for religious services on Sundays. At present the prisoners are in their cells unseen, while the preaching is done in the hall in their hearing. It is urged, we think with good reason, that the prisoners should all be allowed to meet together, in a chapel where they could see the preacher, and he see them, eye to eye; where they could sing together, and feel all the glow which social public worship excites. What a congregation five hundred prisoners would make! How an earnest and eloquent minister would be quickened by such an inspiring company of hearers! What marvelous conversions might be expected among such a class of men, many of whom have broken and sorrowful hearts! Such preaching is the divinely-prescribed means of reforming and regenerating men, and no men are more in need of such means than prisoners, for whom the gospel was designed and sent.

The legislature has appropriated \$10,000 for the erection of a chapel, and it may be hoped that this great desideratum will soon be supplied.

There ought to be a person employed as a secular teacher, especially for those prisoners who cannot read and write. At present there is no provision for secular instruction in the prison. This we hope will soon be provided. The hours of labor need not be encroached upon, for this instruction could be given in the evening.

The library.—The prison library now numbers 2,500 volumes, which are read with interest by the prisoners. It exerts a good influence in the prison.

Commutation and rewards.—The principle of remitting a part of the term of the sentence for good conduct, so universally commended by experienced prison keepers, has been adopted in a small degree in New Jersey. The moral instructor, supervisor, and keeper, all testify to its happy influence on the order and good behavior of the prisoners. The number of those who received a remission during the last year was 215.

The giving *rewards*, by allowing the prisoner to retain a portion of his earnings for his own use when discharged, or for the use of his family, has not yet been adopted in this prison. The legislature will probably authorize it when they next amend the prison law.

Pardons.—This power could not be lodged in safer hands than in the court of pardons, which is composed of the governor, chancellor, and the six lay judges of the court of errors, or a majority of them. The number pardoned last year was 63. It is usual to extend a pardon to a certain class of prisoners, a little before their term expires, so as to save

their citizenship, since a pardon operates as a rehabilitation of the prisoner in his civil rights.

Discharged prisoners.—We have no adequate provision by law for aiding prisoners upon their discharge. The statute allows \$5 to be paid to each convict when discharged; and the lack of State aid is not supplied by voluntary charitable associations. The same motives which would prompt efforts to reform convicts in prison ought to prompt efforts to save them when they go out from relapsing into a criminal life. This subject is receiving special attention, which will result probably in the organization of an aid association, and of additional legislation, perhaps a State commission to take charge of the matter.

Reformation of prisoners.—The principle which underlies all these prison-reform measures rests upon the conviction that punishment, whose chief end is to prevent crime, is effected not merely by depriving the offender of the power to repeat his offense, nor by intimidating others from the commission of a like offense, but by reforming the character of the prisoner (where he has not forfeited his life) and restoring him to society a better man. Superadded to these ideas of punishment is that one of preventing crime by training wayward and neglected children from the paths of vice into those of virtue. Hence our reform schools. New Jersey is making progress in this direction. It is not possible to determine how many prisoners have been reformed, nor to what extent they have been benefited by the efforts made for that purpose, for we have only just begun to make our prison a place where human beings might be improved in character. But we have certain knowledge that much good has been accomplished, and we have faith that in the future much more efficiency will attend the reformatory efforts. The number of recidivists must grow less and less.

II.—County jails.

There are twenty-one counties in the State, and a jail in every county, and in a few instances a workhouse connected with the jail. These county prisons are for punishment as well as for detention. As a general thing, they are insecure, filthy, unhealthy, and utterly destitute of reformatory power. There is no system of discipline by which they are governed. The care of them is rather incidentally committed to the sheriff; but he is under the direction of the chosen freeholders, who are elected more with reference to the building of bridges, &c., than to their qualifications to discipline prisoners and regulate prisons. In structure and government, with perhaps one or two exceptions, they are all a miserable failure. The number of convicts confined in them is too small to justify the expenditure of money necessary to maintain reformatory provisions.

Within a few years past, a sentiment in favor of attaching a workhouse to the jails has resulted in the experiment in three or four counties, but such a policy is not fully vindicated by the trial, especially in the rural counties. The number of prisoners is too few and fluctuating to warrant the outlay involved in conducting a system of prison labor. The character of our jails is such that our courts feel constrained to send too many convicts, guilty of trivial misdemeanors only, to the state prison. There is really no classification of prisoners in the prison system of the State. The jail prison laws need thorough revision. A county jail should be fitted and used only for the detention of persons awaiting trial. If several counties could unite in sustaining a penal prison, to be made reformatory by work and other proper appliances to

that end, it would be an improvement upon the present plan; or if a system of intermediate prisons by the State could be adopted, these penal jails might be dispensed with. We are glad to believe that the present system cannot much longer withstand public opinion.

III.—*The State Reform School for juvenile offenders.*

In 1850 an act establishing a house of refuge was passed, and a building was commenced on a beautiful site at Kingston, but through the freaks of party politics the act was repealed and the work abandoned, the State treasury paying for the loss and damage. Fifteen years were lost to the cause of this reform. But the blunder has been corrected by the act of 1865, which established the State reform school for juvenile offenders. This institution has been organized on a farm of 490 acres near Jamesburgh, in Middlesex County, a central and eligible situation. Suitable buildings have been erected, to carry out the plan of an open farm system, for the reformation of boys between eight and sixteen years of age, who shall have committed some crime other than murder or manslaughter, or shall be habitually disorderly, vagrant, or incorrigible, or otherwise fit subjects for such an institution. Its object is to prevent rather than to punish crime. The boys are taught to work on the farm, and are instructed in secular and religious learning. The number of boys now in the institution is about 140. All the appliances for reformation are employed in this school. It is well governed. The board of control consists of the governor, chancellor, and chief justice of the State, by whom six trustees are appointed, and they exercise a supervision. The approval of a justice of the supreme court is required in every case of committing a boy to the school. It is not a prison governed by physical force, but "the Christian idea of a well-regulated family, with the steady pressure of kind, moral, and social influence governing all its discipline." The family system, in contradistinction to the congregate, is the one here employed. The boys show their appreciation of it by not running away, even when unrestrained. A new family building has just been erected near the main building. There have been 300 boys in the institution since 1867.

It is a success, and a great preventive of crime in the State. It is well managed and liberally supported by the State.

IV.—*The State Industrial School for girls.*

This school has been in operation for a year. It is held in a rented house at Pine Grove, on the Delaware, a little below Trenton. The site and appropriate buildings, though authorized by the legislature, have not yet been procured. There are seventeen young girls in the school, who are employed in making their own clothing, and in helping to make clothes for the boys' reform school. The same provisions which control the admission of boys in the reform school, and the same supervision and control which the governor and other officers exercise in governing the reform school, are applied in this institution for girls. The justices of the supreme court in their circular say:

The institution is not a home for merely destitute or orphan children, but is the offspring of a growing conviction that young females who have violated the law should have some other refuge assigned them than our vile common jails, where there are not only no barriers to constant contact with every class of criminals, but an entire absence of all appliances of a reformatory character.

There are six lady managers appointed, besides the trustees, to supervise and manage the institution.

V.—*Private preventive institutions.*

There are private orphan asylums, children's homes, &c., in the State, which are not state institutions, but are sustained by churches, or private charity, some incorporated and some not, which are germane to those preventive schools of the State above mentioned, in training destitute and neglected children. But we deem it unnecessary to incumber our paper with further details.

General conclusions.

1. The penal laws need revising. The number of *mala prohibita* offenses have been so multiplied that many persons are indicted, convicted, and sent to the state prisons, where they fare precisely as the manslayer and highway robber do, for offenses which are trivial, hardly to be called criminal. There are too many men sent to the state prison.

2. There should be *intermediate prison houses of correction* for those who are convicted only of misdemeanors, and for those who have been in a measure reformed in the state prison, to whom more privileges can be safely accorded of a reformatory character than a state prison can allow. This would, at the same time, greatly relieve the state prison.

3. A classification of crimes, punishments, and prisons should be made by law, and the whole system of jails and prisons in the State should be administered by some central unit power, withdrawing from county jails their penal character, and making them only places of detention, with their structure and government thoroughly changed.

4. Larger rewards should be given to prisoners from their earnings, for good behavior; and more aid should be rendered to the discharged convict either by the State, or, what is better, perhaps, by associated private charity, with state aid.

Toward this high standard New Jersey is gradually progressing.

17. NEW YORK.

By Elisha Harris, M. D., corresponding secretary of the Prison Association of New York.

The penal and reformatory institutions of the State of New York are reported upon by the author of this paper from the stand-point of recent searching personal examination and nearly two years of study and official intercourse with them. If the view presented in the report is not flattering to our State pride, the facts are certainly adapted to awaken inquiry and incite to the efforts needed for the improvement of these institutions and the increased efficiency of the penal and reformatory work to be done by them.

The State of New York has a much greater burden of criminal population than the well-ordered and law-abiding classes of society are aware of. We have three state prisons; six local prisons, under county administration, named penitentiaries; sixty-seven county-jails in our sixty counties; and something more than one hundred police stations, or lock-ups, in the various cities and large towns of the State. Most of the institutions embraced in these several classes suffer from over-crowding, including many even of the county jails, which last are, for the most part, in a condition not to be commended. The number of prisoners confined in the police prisons, where the detention is often only for a

few hours, and never for more than a few days, is not known to the writer. The population of the other prisons named above, in the autumn of 1872, was as follows: State prisons, 2,924; penitentiaries, 2,435; county jails, 1,600; making an aggregate of 6,959. The number of children and youths confined in the five reformatories, viz, the two houses of refuge, the asylum for juvenile delinquents, and the Catholic protectories, (male and female,) was 4,000. This gives a total number of persons under restraint and in custody for violations of law, not including those in police jails, of 10,959.

The total annual number of convictions for felonies by courts of record is less than 2,500, and by lower courts, ranking as courts of sessions, the number is about 80,000.

The law which allows a prisoner to shorten his term of sentence by good conduct and industry is the most effective instrument of discipline at present known to our prison administration. The dark cell, reduced diet, perforated paddle, and all other forms of punishment in use, bear no comparison in their deterring influence and moral power to that of the fear of losing the small gain of time in their sentence allowed by the commutation law.

A perfect understanding now exists between the board of inspectors of the state prisons and the New York Prison Association as to their mutual relations and the rights of the association as regards admission into the prisons and the use of agencies for the salvation of the convicts after their liberation. In each of the three state prisons the corresponding secretary is provided with an office, where he is permitted to send for and converse with any and all prisoners whom he may desire to see, and to counsel and aid with reference particularly to employment after their discharge. The prison wardens, chaplains, and clerks have been officially instructed by the board to give all the information and aid desired by the association for the furtherance of this end, so that it may be enabled to render all the service possible, both to the convicts on their release and to the interests of society and humanity, on whose behalf the service is performed. Lists of the prisoners to be discharged each month are sent to the association in advance, and the secretary visits regularly all the prisons, and has an interview with every such prisoner, to ascertain his physical condition, ability, wishes, purposes, and whatever else may be helpful to him in enabling him to procure work the instant he becomes a free man, if his intention is to pursue an honest way of life. The key to the success that has followed this effort is the employment register, which contains classified lists of more than three hundred employers in thirty different occupations and trades of the best-organized industries all over the State. The private interviews with each convict during the few weeks immediately preceding liberation constitute the first essential step in the whole effort. Great pains are taken in these interviews to reach the convict's judgment, conscience, and heart, and to give him definite instruction and advice concerning common duties and the personal safeguards and care which he will most need when liberated. Care is taken also, on the other hand, to secure in each chosen employer a true and earnest co-worker in the effort to save these men, who are struggling toward a return to honest industry and respectability. As no intermediate stage of testing or preparation is possible, under existing circumstances, in dealing with convicts discharged from the New York prisons, and as it is all-important that they be usefully employed from the day of liberation, and that, as far as possible, they be dissuaded from going into the large cities, except under rare circumstances and definite stipulations

concerning suitable and constant employment, it is not too much to say concerning the helpful interest and efforts of the employers who have lent us their aid in this work, that theirs is the noblest share in it. Modify and improve the present method of this duty as we may, and, indeed, as events and progress in it must require, still the employer who continues to offer to the liberated convict the means for honorable and self-supporting industry and a replacement in the ranks of honest citizenship, will continue to be a chief dependence in all this difficult task.

Each state prison and most of the penitentiaries and larger jails make monthly returns to the New York Prison Association, showing the date of report; the name, nativity, age, and crime of the prisoner; from what county and by what court sentenced; term of sentence; reduction of sentence by good conduct; former habits and occupation; his employment in prison; his social relations and residence of nearest friends; present physical condition as regards ability to labor; amount of money ready for him on liberation; together with such general remarks as the authorities may see fit to append. A card is given to each liberated prisoner, on his entering upon the situation provided for him, containing sundry counsels, of which the following may serve as a specimen: Form the habit of depositing in a savings bank from 25 to 75 per cent. of your wages every pay-day. Keep clear of all bad associates. Maintain a habit of useful reading; with other like maxims. It is expected by the association and the employer that the person thus aided will promise, 1, to live prudently and honorably; 2, to labor faithfully and punctually; 3, to abstain from intoxicating drinks; 4, to maintain self-respect; 5, to deserve the respect of others; 6, to agree with his employer concerning the proportion of monthly or weekly savings.

The Houses of Refuge, the Asylum for Juvenile Delinquents, the Catholic Protectories, the House of the Good Shepherd, the Children's Aid Society, the Truant Homes, and other like agencies, in the metropolis and other large towns, are continually snatching multitudes of children and youth from destruction as "brands from the burning." They are adding at least 10,000 good, useful, and happy lives every year to the population of the country, while subtracting the same number from the crowded ranks of the vicious and the criminal.

18. NORTH CAROLINA.

By Rev. G. William Welker, former member of the board of directors.

The object that the National Prison Association sets before itself, in seeking reports from the several States, it may safely be assumed, is not merely to learn the number, character, and adequacy of their penal, reformatory, and preventive institutions, nor what may already have been accomplished in the direction of the work undertaken by the association, but also to seek data from which to learn what is yet to be done, to discover what hinderances are in the way of this work, and the peculiar condition or character of their populations that have a bearing on the question, if any such exist. It is proposed, in this report, to offer such facts, in regard to our State, as may present the nature and condition of the field for penal discipline and reformatory effort as it now exists; to present explanations that may account, partially at least, for the inadequacy of institutions for the prevention of crime and the little

interest felt in the welfare of our criminal population; and to indicate the difficulties to be encountered in the prosecution of the great work of the reformation of prison discipline and in the efforts to prevent the formation of a criminal class.

There needs, perhaps, a glance at the topography of the State to enable the reader to comprehend some facts to be stated in this report. One of the original thirteen States, the territory of North Carolina began to be settled at an early date. Its area is 50,704 square miles, which is more than that of New York; and yet the population is only 1,071,361. Of this population 678,470 are white and 391,650 colored. Of the entire population only 3,029 are of foreign birth. The territorial extent and homogeneity of population will have a bearing on the statistics of crime in this State and on the character of its penal institutions. North Carolina never has become a refuge for the vicious populations of other States and countries. Its reputation for obedience to law and its freedom from crime, before the rebellion, were known to the whole country. Commerce has never much flourished in this State. Its coast, though extended, bars ingress to its rivers by shifting sand-bars and maddened storms, which seem to keep guard against the outside world. There are no large cities into which the shipping of the world, in bringing its products, brings also its crimes. Wilmington, the largest city in the State, has a population that does not exceed 15,000, while no other reaches 10,000.

North Carolina was a slave State until 1865; manufactures were never encouraged; and hence its streams are not lined with manufacturing villages that give employment in their mills to a floating population, in which are commonly found those who swell the calendar of crime. A very large proportion of the million of its population is and has ever been engaged in planting and farming. While the farms were valued at \$143,301,065, the capital invested in manufactures and trades was only \$9,693,703. So the population is largely rural, and thinly scattered over a wide domain, having no populous and wealthy centers. In such population capital crime is unusual. Vagrants are not tolerated, and hence soil is wanting for the vicious classes. This may account, in part, for the fact that the attention of the State was not at an earlier day directed to the question of penal discipline.

That a State should grow as old as North Carolina, and yet have done so little in the way of preventing crime and reforming its vicious classes, may be owing to the fact that general intelligence has not been diffused among the people; that public schools are not appreciated, and that those who will not voluntarily tax themselves to organize schools and build school-houses for their own children, would naturally refuse to submit to taxation for the creation of institutions to prevent crime or reform criminals. The legislature of the State is mostly controlled by the tax-payers; their influence is seen in the practical denial of the axiom that "an ounce of prevention is worth a pound of cure." Although the constitution of the State, formed in 1868 by men of liberal and progressive views, provided for the creation of a board of "public charities," yet to this hour the general assembly, under its narrow and obsolete views, has denied that board all means for its work, even to the publishing of its annual reports. While the constitution provides for the erection of juvenile asylums, reformatories, &c., nothing has been done in this direction, and the fear of taxation paralyzes every effort at saving the large number of youths that are left to criminal associations. The recent political and social revolution has created a necessity of this kind, which is not felt as its pressing character demands. A pop-

ulation now requires the care of the State which, under the *régime* of slavery, rarely had its misdeeds brought to the notice of the courts. The slave being a chattel, most of his petty crimes were punished by the master, the patrol, or by a magistrate having summary jurisdiction. This state of affairs kept a large part of the crimes against society, not of the most serious character, from public view and knowledge, and relieved the State from direct concern. Slaves of every age being property, and, by the law, the owners being, in some degree, made liable for their conduct, the former could not conveniently be made objects of such legislative care as would express itself in reformatories and work-houses, where criminal propensity could be cured, and progress in crime arrested. These facts should be allowed their just force when we come to learn the position of the State in making provision for her existing criminal population.

The constitution of the courts, the forms of legal procedure, and the penalties against crime were, in their main features, down to the era of emancipation, those of the colonial days of the State; and the progress in criminal jurisprudence made by other States had hardly left its impress upon our statutes or our courts. In all the statutory laws of many years is seen and felt the presence of slavery. No care was had for the prevention of crime but such as grew out of the deterrent power of severe punishments. While the law visited condign punishment on all convicted offenders, there was no wise or kind forethought in its provisions by which to prevent or reclaim any class of citizens from becoming or continuing criminals. Every person convicted of a felony was looked upon as degraded beyond the regard or sympathy of society. He was subjected to the tortures of the whipping-post, the branding-iron, or, still worse, the loathsome companionship of the county prisons. It never came into mind that the lowly, the unfortunate, or the fallen still retained sensibilities which could be outraged, or that they were worth an effort of the State to reform and save them. Deep-rooted prejudice still holds the public mind to barbarous modes of punishment and counts offenders as outcasts, hopelessly lost to all the claims of humanity and religion. When in 1848 the question was submitted to the vote of the electors of the State, "penitentiary" or "*no* penitentiary," it was voted "No" with a perfect frenzy, not a single county, probably, voting in favor of such an institution. So until the revolution of 1861-'65, the only place of confinement for the convicted and those awaiting trial was the county jail.

There is a jail in each of the ninety or more counties of the State. Among all these prisons there is not one that would be a proper place in which to confine a human being under any circumstances. In their structure no regard is had for proper ventilation. Many of them have no means of being warmed even in the coldest season. Very often there is found in them a most offensive uncleanness. In these loathsome places all whose misfortune or crime makes them liable to imprisonment are huddled together, young and old, the guilty and the innocent, the hardened criminal and the youth arrested for his first offense. Here they are kept without work, without instruction, without occupation of any kind, except to recite and listen to recitals of robbery and crime. Thus the jail becomes a school of crime, in which its inmates are prepared for a life of resistance to the laws of God and man.

The framers of the constitution adopted by the people of North Carolina in 1868 made provision for the future of this State as regards reformatory and penal institutions. Had the intentions of that body been realized, the State would now have a secure and comfortable state

prison. The site selected is on a fine and healthy elevation, west of the city of Raleigh, on the line of the North Carolina Railroad, with a side-track running into the prison yard. At present only the foundation of the prison has been completed, its further progress being hindered by partisan legislation. The convicts are confined in temporary wooden huts, and are mainly employed in grading the grounds, in quarrying stone, and in building the exterior wall surrounding the prison yard.

The number confined in the penitentiary during the year ending November 1, 1872, was 493. Of these, 102 were whites and 391 colored; 352 could neither read nor write; 335 were natives of the State; 4 only were foreigners; and 112 were under twenty years of age. Nearly three-fourths of the convictions were for larceny, and almost all for crimes against property.

Of the 493 convicts, 33 died during the year, one in every 15, or nearly 7 per cent. This is a fearful mortality. The cell-huts are overcrowded; they cannot be ventilated; and they cannot be heated in the coldest weather. There may be other causes, but no State can be justified in such waste of human life by refusing to provide well ventilated and comfortable cells with wholesome food and plenty of it.

The penitentiary is managed by a board of five directors, appointed by the legislature, who name the warden, steward, and other officers.

The rules, originally adopted by those whose duty it was made to organize it, forbid all harsh and degrading treatment. The treatment was intended to be such as to win to a better life by kindness. Respect was had to the manhood of the prisoner, who was to be treated as one who might create for himself an honorable future. How far the philanthropic spirit of these regulations is carried out at present, the writer has no means of knowing.

In the existing condition of the prison building it is not possible to classify the convicts. No effort is made to keep them separate for any moral or reformatory end. Youthful transgressors, unused to the dark ways of crime, are put into a hut-cell with hardened villains who have reached the utmost bound of human wickedness. The boy of eighteen who took a piece of bread to satisfy hunger, or in a momentary passion committed an assault upon a fellow, is placed under the immediate training of those who are guilty of murder and robbery, finished adepts in crime. So, too, the prisoner who is repentant and tries to amend his life, who is industrious, obedient, and docile, is put in daily contact with the obstinate and ungovernable, who plot escapes and plan schemes of mischief. While the State provides no instructors in letters or morality, it nevertheless has teaching done, and sustains a school for crime, in which graduated villains teach the uninitiated all its secrets.

No provision, as just intimated, is made for scholastic or religious instruction. The great mass of ignorance has not a ray of light to pierce and enlighten its darkness during all the years of incarceration. From the statement previously made in regard to the illiteracy of the convicts, it clearly appears how much ignorance has had to do with sending them to state prison, and how much it is both the duty and interest of the State, while these neglected creatures are its wards, to educate them at least so as to fit them for common business life. A neat and comfortable chapel has been erected, but there is no chaplain, no Bible-class, no Sunday-school. An occasional sermon is preached to the prisoners, as some clergyman may be had to do it; that is all.

It is a sad lot, indeed, for youths, and those new to crime, that they should not be brought under the teachings of the Christian religion. It is matter of astonishment that, while the State fails in this

work, it is not taken up by the private effort of the Christian people and churches of the city of Raleigh. Here is work for a "Young Men's Christian Association" that will, in some measure, make amends for the neglect of a Christian State.

No abbreviation of sentence is allowed under the laws of the State. Good behavior or proof of reformation goes for nothing. There is no difference between being an obedient, docile, and industrious convict and an obdurate and obstinate one; both go forth free when their whole term of sentence is completed, and not till then. Even in a penitentiary there should be some recognition of right-doing, and such convicts as demean themselves well should redeem time from the term of their sentence. A measure of this kind is no novelty. It has become an element in prison discipline of many of our States and not a few foreign countries, and everywhere its good results have made themselves abundantly manifest. No provision is made either by the State or by private charity to aid and encourage, on their discharge, such prisoners as show some disposition to change their course and lead an honest life.

It was the purpose of the legislature which made the original appointment of directors, to relieve the penitentiary of all partisan character in its management, but events overruled their purpose, and now, as in most institutions belonging to the State, not only the directors but all the subordinate officials are appointed in view of their partisan relations. It is to be hoped that time will teach a better way.

There are no reformatory or preventive institutions in the State. The constitution makes provision for their creation, but so far it has remained a dead-letter.

19. OREGON.

No formal report was received from this State, but in a private letter received by the secretary of the National Prison Association from the Rev. Dr. Atkinson, he states that, as regards prison reform, things are moving on hopefully there. He says that new and greatly improved prison constructions for the State penitentiary are in progress, with ample grounds; that the system of scholastic, moral, and religious education has been much enlarged and placed on a better footing; that the prison dietary is excellent; that whipping has been abolished, and more humane and rational disciplinary treatment has been substituted, not only without loss, but rather gain, to the good order and obedience of the prisoners; that a kindly and hopeful feeling as regards the reformation of the prisoners begins to be entertained quite extensively by the people of the State; that, upon the whole, the state prison of Oregon may be said to be in a good condition, and to be doing well; that the chief city of the State last year completed a fine police courtroom and prison, in which the rooms are well lighted and ventilated, and every way comfortable; that the county jail in the same place is in the basement of the court-house, and consequently rather damp, but that effort is making to improve the ventilation, and make it at once safe for health and more comfortable for its inmates; that a law has been enacted to establish a reform school for boys and girls, and trustees appointed to carry it into effect; and that the abundant efforts of late put forth in this and other countries, through congresses, public meetings, the pulpit, and the press, in the great work of prison reform,

have borne their legitimate fruit in Oregon, in awakening in the good people of that State, thought, interest, and exertion.

20. RHODE ISLAND.

By Rev. Augustus Woodbury, chairman of inspectors of Rhode Island state prison.

The State of Rhode Island is divided into five counties, and in 1870 had a population of 217,353.

The penal and reformatory institutions of the State consist of the town bridewells, the city station houses, the county jails, the state prison, the Providence reform school, and the state farm. The bridewells and station houses are under the care of their respective municipal governments. The county jails, with the exception of the jail for Providence county, are in the charge of the sheriffs of the counties, who are elected annually by the general assembly. The state prison and the Providence county jail, together with the house of correction, all within the same inclosure and beneath one roof, are administered by a board of seven inspectors appointed annually by the governor. The Providence reform school is under the direction of a board of trustees, six in number, elected annually by the city council, to whom is added the mayor *ex-officio*. The management of the state farm is placed in the hands of the board of State charities and corrections, consisting of six members, appointed by the governor, with a term of service for six years, one of the board retiring every year. The board elect a secretary, who thus becomes a member *ex-officio*. In addition to the several boards of management there is a visiting board of ladies, whose duty it is to visit and inspect all places where females are imprisoned. All these boards make annual reports to the general assembly, with the exception of the trustees of the Providence reform school, who report to the city council.

The county jails.

The county jails outside of Providence are inspected by the justices of the supreme court at the commencement of each term. The jails are reported to be at present in good condition and secure. The number of commitments, except in Providence, is very small. During the past year there have been only 192 persons committed. On the 31st of December, 1872, there were in jail 9 prisoners in the whole State. In Providence county there have been 1,749 commitments during the year, 169 of whom were women; and on the 31st of December there were 113 prisoners, 104 males and 9 females, in jail; average number, $99\frac{43}{366}$. By the statute all prisoners punishable by fine of not less than \$5, or a term of imprisonment of not less than thirty days, are to be sentenced to the Providence county jail.

The state prison.

In the year 1797 the general assembly ordered the erection of a state prison, in connection with a new jail for the county of Providence, but in the following year the order was rescinded, and it was not until 1835 that measures were adopted looking to the project of building a prison for the State's convicts. The general assembly, in January of

that year, referred the matter to the freemen of the State, to be decided by a popular vote. In April the vote was taken, resulting in 4,433 votes in favor of building the prison, and 502 against it. The general assembly, upon ascertaining the will of the people, and after examining the merits of the Pennsylvania and Auburn systems, gave the preference to the former, and directed that a prison should be built accordingly. The building was completed in 1838, and in November of that year was opened, with three convicts as the total number of its inmates. Before the end of the month two more were added. At the expiration of the first year of the prison, September 30, 1839, the number had increased to ten. On the 30th of September, 1840, there were sixteen convicts in prison, fifteen males and one female. At this time the population of the State was 108,830.

Four years' trial of the Pennsylvania system convinced the inspectors and the immediate officers of the prison that the mode of separate confinement with labor was harmful in its effects. Workshops were erected in 1843. At a later period the necessity of a new and better constructed prison became evident, and in 1852 a new building, containing eighty-eight cells, was erected, at a cost of \$17,632 37. This was constructed as an addition or wing to the former prison, which was thenceforward used as a jail for the county. The constantly increasing number of jail prisoners compelled a larger provision for their accommodation, and in 1855-'56 another wing was added to the prison, containing seventy-two cells and two hospitals; a new wall was built and a new workshop erected, at a cost of \$47,143 37. One-half of this wing was used for the imprisonment of female convicts. Ten years later the county jail was relieved of most of its female inmates, and at present a single corridor of cells, entirely separated by heavy flooring and partitions from the remainder of the building, suffices for the restraint of female prisoners. On the 31st of December, 1872, there were in the state prison two and in the jail nine females. In the state prison there were at the same date seventy-one convicts; in the jail one hundred and thirteen prisoners. For the internal administration of the prison and jail there are required a warden, deputy warden, and eight assistant male officers, and a matron, chaplain, and physician. The warden, chaplain, and physician are appointed by the inspectors. The other officers are appointed by the warden, subject to the approval of the inspectors. In the internal administration of the prison a system of classification has been adopted by which the prisoners have been divided into five grades: 1. Excellent; 2. good; 3. tolerably good; 4. unsatisfactory; 5. bad. In 1872 the following results appeared: First grade, 33; second, 10; third, 10; fourth, 34; fifth, 4. The schedule is prepared monthly and submitted to the inspectors at every monthly meeting of the board. The inspectors, to whom the entire control of the state prison is committed, have full power and authority, according to the statute, to enlarge the confinement of the convicts and regulate their labor and exercise within the limits of the prison yard or of any of the prison buildings. They hold monthly meetings, audit all the accounts of the warden, make contracts for the labor of the prisoners, by one of their number visit the prison at least twice every month for purposes of inspection or for hearing the complaints of the prisoners, and have, in general, the complete oversight of the institution. The prison is divided into six departments, of general management, of labor and finance, of religious and other instruction, of sanitary condition, of repairs and of supplies. The first department is under the charge of two inspectors, one of whom is the chairman of the board; the other departments are under the charge

each of one inspector. The service of the board is rendered without any remuneration of any kind, except exemption from jury and military service. The prison at the present time is self-supporting. For the year 1872 the profits of both prison and jail amounted to \$4,518.90; in 1871 the income above expenses was \$3,018.46. The labor of the prisoners, shoe-making, is performed under contract, at the rate of 70 cents per day for state prisoners, 35 cents for jail prisoners, 17½ cents for prisoners who work less than thirty days. The whole number of convicts committed to the state prison since its opening, in 1838, is 692. The expense of maintenance *per capita*, for 1872, was \$110.75.

The Providence Reform School.

In May, 1847, the Providence Association of Mechanics and Manufacturers memorialized the city council of Providence for the establishment of a house of reformation. In 1850 an act was passed by the general assembly authorizing the city to establish a "school for the confinement, instruction, and reformation of juvenile offenders and of young persons of idle, vicious, or vagrant habits," the government of which was to be vested, as already stated, in a board of seven trustees. The trustees are empowered to receive into the school thus established all such children, under the age of eighteen years, who shall be convicted, before any court sitting within the city limits, as vagrants or disorderly persons, or of criminal offenses, or of offenses against the city ordinances, and such children as shall be convicted of criminal offenses before any court in the State, or of the United States sitting within the state limits. They may also admit any child above the age of five years, at the request of parents or guardian. Children thus sentenced or admitted shall be held under restraint for a term not longer than during their minority or less than two years, the trustees having the power of discharging such children as are considered reformed, before the expiration of their sentence, or of binding out the children as apprentices, or, in cases of incorrigibility, of remanding them to the county jail, house of correction, or state prison. They are, while inmates of the school, to be taught in virtue and morality, and in such branches of useful knowledge as shall be suited to their age and capacity. They are also to be instructed in regular courses of labor. The expense of maintaining the school is divided between the State and the city, the former paying the actual cost of supporting the children who have been sentenced by the courts, the latter paying for buildings, grounds, salaries, instructors, and the like. The cost of maintaining, deducting the earnings of the children, is estimated at the rate of \$110.87 for each inmate; without such deduction, \$218.60.

A large hotel in the south part of the city, overlooking a very beautiful prospect of Narragansett Bay and the adjacent shores, known to the traveling public of former days as the Tockwotton House, was purchased by the city of Providence, and the school was formally opened November 1, 1850. In January, 1854, the Hon. W. R. Staples, an eminent jurist of Rhode Island, delivered a charge to the grand jury, at the opening of his court, in which he speaks thus of the school: "It was opposed in the beginning by some of the citizens of Providence as not being within the range of objects properly belonging to a municipal corporation. On the trustees and other officers it imposed duties and responsibilities, every part of which to them was new and untried. They had gleaned some information from other similar institutions, but that knowledge was, of course, only theoretical. The buildings where

it is established were erected for very different objects, and of course are not so convenient or well adapted for its present use as one built expressly for such a school would be. Many are the disadvantages under which it has had to labor. Still, it has been more successful in its results than its friends anticipated, and promises to give effectual aid in diminishing the number of prisoners in our county jail and state prison." * * * * Its inmates, he goes on to say, within its walls "are secluded from all the associations which tend further to corrupt them. There, habits of industry, sobriety, and sober reflection are substituted for idleness, profanity, intemperance, and folly. There, all the deficiencies of their early moral culture may be supplied, and they have the benefit of good example, wholesome instruction, the means of improvement in virtue and knowledge, and the opportunity of becoming intelligent, moral, and useful members of society." Since the time at which this charge was delivered the school has been improved by the addition of new buildings, the extension of its grounds, and an enlargement of its means of instruction.

Within the last three years an addition has been made to the north wing of the main building—for the accommodation of the boys belonging to the school—furnishing accommodations for thirty-six dormitories, each 4 feet 6 inches by 8 feet, neatly furnished and amply ventilated; a large finely lighted school-room, 35 feet by 47 feet, and 12 feet high, furnished with desks for one hundred pupils, supplied with blackboards and all the necessary appliances for thorough instruction, and connecting with a large room—19 feet by 12 feet—for the library and class recitations; and a fine bath-room, with a tank 12 feet by 17 feet, and 3½ feet deep, with closets for clothes, &c. The building is of three stories—37 feet 6 inches by 62 feet 6 inches—with a slated French roof and a dry, large basement, under two-thirds, the other third forming a covered arcade for the protection of the boys from the weather while engaged in recreation in the yard. It is hoped that, before long, a similar building will be erected for the girls. It is very greatly needed, and has been earnestly recommended.

The number of inmates from the opening of the school to November 30, 1872, is 1,616 boys and 433 girls. The average number of months in the institution of those discharged has been, for all committed, 16.9 for boys, 22.2 for girls. Inmates have been received from every town and city in the State, except New Shoreham, and from one or two places beyond the territorial limits of Rhode Island. Instruction is given in reading, writing, geography, arithmetic, sewing, and other domestic labors. Gardening and fruit-culture have also received considerable attention, and the labor performed in the workshop amounts to a sum not far from \$20,000 annually. For the year 1872, the amount received from labor, \$21,977.46. The number of inmates committed during the year ending November 30, 1872, has been 103 boys and 10 girls; number discharged, 107 boys and 24 girls. The number in the school November 30, 1872, was 156 boys and 37 girls. The superintendent estimates that the system pursued is beneficial to the extent of reforming and saving to society about 75 per cent. of the boys and 50 per cent. of the girls. The institution is under the charge of a superintendent, an assistant superintendent, a matron, an assistant matron and nurse, physician, steward, two male and two female teachers, four male and five female overseers. Religious services are held every Sunday afternoon, conducted by members of the board of trustees, or by gentlemen invited by them for the purpose. A Sunday-school is held every Sunday in the forenoon, 9½ to 11. The trustees hold quarterly meetings in

March, June, September, and December. A committee of the trustees meet twice each month for visitation and other necessary business. They perform their duties gratuitously. They declare, in their last printed report, that "the general condition of the institution is entirely satisfactory to the trustees, and its prospects of usefulness in the future highly encouraging." The system of management, discipline, &c., is the "congregate." The lady visitors are of the opinion that, for the girls at least, the family system would be preferable.

The state farm.

At the January session of the general assembly in the year 1867, a committee was appointed to "inquire into the expediency of erecting a state asylum for the insane." At the January session in the year 1868, the committee reported favorably upon the subject, and a new committee was appointed for the purpose of selecting a suitable place for such an institution—it being understood that a tract of land containing not less than 200 acres should be purchased. In the view of this committee, a necessity existed for a new house of correction, as well as an asylum for the insane. In 1869, at the January session, a third committee was appointed, with power to buy a suitable farm for the two institutions and "for such other purposes as the general assembly may direct." The committee was also instructed to report a "plan for the organization and establishment of a house of correction and state pauper system." A tract of land, containing 398 acres, finely situated, in the town of Cranston, was purchased for the sum of \$27,500, and soon after the 1st of June, 1869, came into possession of the State. On the 28th of May of the same year, an act was passed establishing a board of state charities and corrections. This board consists of six persons appointed for six years, two from the county of Providence, and one from each of the other counties in the State, with power to choose a secretary, who, by virtue of his office, becomes an associate member. The board was also directed to appoint a superintendent of state charities and corrections, to whom was to be committed the duty of overseeing the general business of the board, of examining paupers and lunatics, and of removing them to their proper "places of settlement." The act contemplated the erection of a state workhouse, a house of correction, a state asylum for the incurable insane, and a state almshouse. The inmates of the state workhouse were to consist of persons who had abandoned, neglected, or refused to aid in the support of their families; idle persons, of doubtful reputation, and having no visible means of support; sturdy beggars, vagrants, prostitutes, common drunkards, night-walkers, lewd and lascivious persons, frequenters of places of ill-repute, cheats and disorderly persons—and these were to be sentenced for a term not less than six months nor more than three years. The board can require any steamship or railroad company to make returns of the names, sex, ages, and nativity of any class of passengers brought into Rhode Island, and the company is liable for the support of any pauper thus introduced into the State for the period of twelve months, or for his return to the place whence he was brought. The cities and towns in the State may send to the state almshouse all paupers not having a legal settlement within their respective limits. Any lunatic having no legal settlement in the State, but supported by any town or city, if incurably insane, may be sent to the state asylum, to be supported at the expense of the State. The incurably insane who have a legal settlement are to be sent to the asylum, to be supported by the town or city to which they respectively

belong. Any inmate of the reform school who may be considered incorrigible, or unfit to remain in said school, may be transferred to the state work-house. The board of state charities and corrections have the power of discharging any of the inmates of the institutions upon the farm, and of binding them out for service with suitable and trustworthy persons.

The board, immediately upon taking possession of the farm—increased by subsequent purchase to 417.7 acres—began the erection of buildings suitable for the reception of the expected inmates. Two workhouses and two buildings for the insane were erected during the year 1869; an additional building, for the accommodation of the violent insane, and a chapel were erected in 1870. In 1871 measures were adopted for building a strong workhouse, which could also be used for a house of correction, which, it is expected, will soon be completed and occupied. It is constructed of stone, and will provide for the accommodation of “two hundred male and one hundred female inmates, properly graded, with complete separation of the sexes.” Religious services have been held from time to time, conducted by different gentlemen and ladies, and a Sunday-school was in successful operation during the years 1870 and 1871. A fire at the farm in April, 1872, destroyed the chapel and interrupted both the school and Sunday services.

The amount expended for all purposes at the farm from June 1, 1869, to January 1, 1873, has been \$371,444.15. The property is valued at \$212,227.07. It is believed that the amount has really been more than saved to the State by the removal of paupers not belonging to the State to their proper places of settlement and abode. The whole number of inmates received at the state workhouse from the beginning to January 1, 1873, is 1,271, of whom 359 were females and 912 were males; of these 695 were of foreign parentage. The whole number of insane persons received at the farm is 239; the number remaining January 1, 1873, was 153—70 males, 83 females. The board of state charities is organized with a chairman and secretary and five standing committees: 1, on the farm; 2, on supplies; 3, on buildings and repairs; 4, on labor and discipline; 5, on finance and audit of accounts. The executive officers are a superintendent of state charities and corrections, a superintendent of the state farm, a deputy superintendent of the workhouse, a deputy superintendent of the insane asylum, and a physician. Under-officers, matrons, &c., are appointed according to the needs of the institution. The board serve gratuitously, except that their necessary expenses for traveling and attendance upon their meetings are paid by the State.

The objects proposed by the establishment of the state farm were, 1. The removal of paupers, not domiciled in the State, to the places where they really belonged. 2. An improvement in the care of paupers and the insane poor, which was greatly needed in Rhode Island. 3. The reformation of vagrants, drunkards, abandoned women, and the like. The first two of these objects have been fully attained. In the years 1870 and 1871, 465, in 1872, 125 paupers were removed from the State. The insane department is regarded with peculiar satisfaction. “The unfortunate persons in that department,” says the secretary of the board, “are made comfortable and as happy as is possible for them to be. It is certain that the condition of those brought from town poor-houses is greatly improved, and even those brought from our best hospitals profess to be pleased with the change.” In regard to the third object proposed, results have not been so satisfactory as was anticipated. It was hoped that absence from temptation, the benefit of pure air and simple food, regular habits, out-of-door work, surrounded by scenes of natural

beauty, and wise and careful instruction and oversight, would materially aid in reclaiming those unfortunate persons who are overcome by appetite and lust. Sentences were made, in a measure, indeterminate, the board having power to discharge those who are considered as having been benefited by their restraint. It is estimated that but very few persons have thus far been reclaimed from dissipation and vice. The board believe that a larger number than ever before has been benefited during the last year. The secretary, in his report for 1871, regards the moral and reformatory agencies as a failure. He attributes the poor results in this direction to three causes: 1. "The depravity of the human heart when educated in a course of dissipation." 2. "The situation and circumstances of the workhouse itself, the crowded halls and dormitories rendering all privacy impossible." The building used as a workhouse is evidently unfit for the purposes of its erection. 3. The shortness of the time of sentence. Half a year, which is frequently the term of sentence, is too brief for weaning these men and women from the habits of nearly a lifetime. He suggests as remedies, 1. Longer sentences. 2. A complete change in the internal arrangement of the workhouse, which he hopes will be effected in the new building. 3. Greater efforts to awaken the minds of the inmates, and to give them proper instruction in evening and other schools, and by familiar lectures and addresses and religious exercises on Sundays. The board, however, feel assured that better and more encouraging results have appeared within the past year, and they look forward hopefully to the future. Still it must be borne in mind that our state farm is of very recent establishment, and is yet to be regarded somewhat in the light of an experiment. The buildings were hastily erected, and were at once crowded with occupants. An imperfect system of organization prevailed, and affairs became somewhat chaotic. Such is always the case with a new enterprise which is hurriedly undertaken, for the supply of an immediate and pressing need. As more suitable buildings shall be erected and a more thorough system of government come into operation, there can be no doubt of beneficial results. A judicious and persevering effort to treat the whole subject of reformatory and punitive discipline with practical sagacity, with scientific method, and a humane spirit, cannot fail of success.

Board of female visitors.

The board of female visitors to institutions where women are imprisoned was constituted in the year 1870. It consists of seven ladies, appointed annually by the governor. These ladies visit the different penal and reformatory institutions in the State, and are organized with a president, secretary, and three committees: 1. To visit the state prison. 2. To visit the Providence reform school. 3. To visit the state farm. Their duty is to visit and inspect these places, converse with the women and girls there under restraint, and offer such suggestions as they think are necessary in the cases which come to their knowledge. It is believed that their work has been efficient and valuable, and it is hoped that ere long separate prisons and reformatories for women will be established, to be wholly under the control of persons of their own sex.

Commutation.

In order to complete the view here given of our treatment of the criminal class under sentence, I would say, in addition, that a system

of commutation prevails in the state prison, allowing to convicts for good behavior one day in each month for every year of sentence below five years; and that it is in contemplation to allow convicts a certain portion of their earnings. Capital punishment was abolished in Rhode Island in January, 1852, and imprisonment for life substituted for the penalty of what had been known as capital crimes. In December, 1872, death by hanging was declared to be the penalty for murder committed while in prison by a person under life-sentence.

Discharged prisoners.

A society for the aid of discharged prisoners was organized in Providence, in March, 1872. Its officers are a president, vice-president, secretary, and treasurer, and an executive committee, composed of one person from each of the boards which have been mentioned. The society, having had but a brief existence and a small membership as yet, has not been able to accomplish much more than a preparatory work. But few applications have been made for aid, as the state prison authorities have an arrangement with the contractors at the prison to furnish employment in their outside shops to such discharged convicts as have proved themselves good workmen, and have earned a certificate of good behavior. As the means of this society increase, it is expected that more complete study of the subject of prison discipline will be entered upon, with a view to ascertain the best methods for working out the desirable result of the reformation of the criminal. The society has the sympathy of the best members of our community, and a future of prosperity and usefulness is confidently anticipated.

Main features of Rhode Island prison system.

The main features of the Rhode Island system of prison discipline are: 1. The authority given to the several boards of trustees and inspectors to direct and control the management of the several institutions without interference from any quarter, to appoint the officers, to manage the finances, to arrange for the labor and instruction of the inmates, and, in some instances, to discharge the prisoners. 2. The entirely gratuitous services of such boards of direction. 3. The freedom from political bias in making the appointments. 4. The existence of a board of female visitors. 5. The abolition of the death penalty, except in cases of murder committed in prison by a prisoner under life-sentence. 6. A system of commutation. 7. A partial system of classification of prisoners.

21. SOUTH CAROLINA.

By General J. C. Stolbrand, superintendent of the state penitentiary.

Liberally as the people of the State have heretofore contributed to build up and maintain charitable institutions for lunatics, orphans, deaf-mutes, and other classes of unfortunates, there were in the State, previous to the termination of the late war, no penal or reformatory institutions of any kind.

The district county jails were then, even more than now, of the rudest and most primitive kind.

This state of things was probably owing to the severity of the then criminal laws, (now much modified and milder,) under which were inflicted capital punishment upon such criminals as now, in almost every State of the Union, receive sentences of from two to ten years imprisonment with hard labor.

In 1866 Governor James L. Orr, with admirable tact and foresight, succeeded in securing from an unwilling legislature a small sum of money for the purpose of constructing, temporarily, a place of safety for such offenders as might prove, under the new order of things (emancipation having become of effect) too dangerous to the community, and upon whom the death penalty, according to then existing statute, seemed too severe.

From this action on the part of Governor Orr originated what is now known as the South Carolina penitentiary.

In 1868, after the reconstructed government of the State had come into operation, under the new constitution, it was decreed by the legislature that the penitentiary at Columbia should be the general penitentiary and prison of the State, for the reformation as well as the punishment of all offenders. Ground was broken for the institution, November 17, 1866, but no convicts were received until April 18, 1867. Since then the institution, for want of means, has advanced but slowly in the way of erecting and completing the necessary buildings.

Since the last-named date no hired labor (except foremen in the different branches) has been employed. The quarrying and cutting of the granite for the buildings, the weaving of the cloth and making it up into garments, the cooking, washing, shoemaking, &c., have all been done by the convicts.

The plan of the prison provides for the erection of five hundred cells, divided into two wings, which are to be united by a central building for the administration. There are now three hundred and forty cells mostly ready for occupancy under a temporary roof, which serves for shelter until the inclosing wall shall have been completed and permanently roofed.

A school has been organized, under a competent teacher, which promises good results. Religious service is regularly maintained on the Sabbath, and a Sunday-school has been in operation for about two years.

The first official report of the institution was dated January 1, 1868, and states that the inmates then numbered 187; in 1869 the number was 222; in 1870, 317; in 1871, 309; and in 1872, 300. The number of whites has not varied materially from 10 per cent. of the whole number. Considering that this is the only penal institution in a State of 720,000 inhabitants, it is believed that the number of criminals compares not unfavorably with other States.

Theft is the besetting sin in this commonwealth. More than five-sevenths of our criminals have become such under that designation. About one-seventh have committed offenses against the person by violence, while the remaining seventh comprises offenders of all grades and descriptions.

It is to be hoped that a proposition now before our legislature to establish a reform school for boys may result in the consummation of so needful and desirable an end.

Any one giving even a casual glance at our social condition and development will be struck with the illiteracy and ignorance of a great majority of the people. That this is owing to our former system of slavery is not doubted. The only remedy lies in the gradual extension

of the common school, whose widening and beneficent influence is, even at this early period, felt in every part of the State.

22. TENNESSEE.

By W. M. Wright, M. D., superintendent of prisons.

In the absence of my annual report, made last week to the legislature, but not yet published, I beg leave to submit the following brief statement of facts with regard to the state prison of Tennessee: There are now in the penitentiary at Nashville, and its branches throughout the State, 744 convicts. Of this number about 400 are colored; 35 are females, only one of whom is white. In December, 1871, the legislature leased the state-prison, including its branches, to a private company, at \$33,000 a year for five years, the lessees paying all expenses. By a stipulation in the contract the State retained entire control of the treatment of the convicts. For four years preceding the lease, the prisons cost the State \$114,000 annually. The legislature, to get rid of this heavy burden, and at the same time do exact justice to the criminals, according to the enlightened philanthropy of the age, entered into the above-mentioned contract, with the necessary restraining provisions to guard the moral interests of the convicts. The legislature believed, and their wisdom has been justified, that they could lease out the prisons and at the same time introduce and carry into effective operation all the reformatory measures consistent with the good government of penal institutions and the well-being of society. The measures adopted for the reformation of criminals are the commutation or good-time law, the regular employment of chaplains, who have service every Sunday morning and Sabbath-school in the evening, the distribution of good books, periodicals, &c. I can see very little difference in the means used in Tennessee for the reformation of criminals and those employed in other States whose reports have been read to this body. I only consented to make these few remarks that the congress might know that Tennessee is not an idle or indifferent spectator of the grand reformatory revolution in the management of criminals, which is engaging the best minds of our country and enlisting the active sympathy and intelligent study of every civilized country throughout the world. The plan adopted in Tennessee works well and is satisfactory.

23. TEXAS.

By Rev. Benjamin A. Rogers, commissioner to the International Penitentiary Congress of London, and president of the prison reform association of Texas.

The State of Texas has an area of 338,000 square miles, with 136 organized counties, and a population of nearly 900,000 souls; of which a fraction over two-fifths are colored. In territorial extent it is the largest State in the American Union, having also the greatest diversity of climate, soil, and productions. With its vast sea-coast, its navigable rivers, its rapidly extending railroads, and its swelling tide of immigration, it may perhaps be allowed to count itself among the most prosperous of States; and it is utterly without excuse if it fails to enter, with vigorous step, into every reform that tends to the safety, progress, and

happiness of a people. But notwithstanding the flood of light that the last fifty years have thrown upon the subject under consideration in this report, Texas is to-day wholly without public reformatory institutions (usually so denominated) of any kind. Its barrenness in this regard is not without, at least, one advantage: its field of operations is an open one; where nothing exists, there are no errors to be corrected, no strong prejudices to overcome; and much may be hoped from time and effort.

The State has but one penitentiary, or state prison, which is located at Huntsville. Nearly every county has its jail. As to the number, sex, and ages of prisoners, whether in the penitentiary or jails, I cannot speak with any degree of accuracy, as I have been unable to obtain answers to my questions addressed to the penitentiary contractors, though strongly seconded in my efforts by the governor of the State. I suppose the penitentiary convicts number from 600 to 800 persons, and the inmates of the jails as many more.

There is no central authority charged with the administration of the prison system of the State. Each county has charge of its own jail affairs. The consequence is, that the jails are mere filthy pens, or horrible dungeons, where, in many instances, all sorts of criminals, all ages, and both sexes, are herded together, like cattle; often with little air, little light, and no cleanliness. The county courts are responsible.

The penitentiary being in the hands of contractors, the administration of its discipline is very largely in their hands also. The discipline is simply deterrent; or at least it is so intended. The agencies adopted are labor, the dungeon, and the stocks—the last too liberally used.

There is no provision of law for instruction of the convicts, except in labor; and what is not provided for by law is not likely to be furnished by contractors, whose business it is to make all that can be made out of the convicts' labor, regardless of higher ends.

In the penitentiary itself, various kinds of manufacturing are carried on. But much convict work is performed outside, as the contractors are allowed to put the convicts upon the railroads of the State, where they work under an armed guard. This, while it sometimes ameliorates the immediate condition of the prisoner, is really a pernicious system. It encourages attempts to escape—sometimes resulting in success, and thus cheating society of its security; sometimes issuing in capture and punishment, thus subjecting prisoners to unnecessary suffering; and sometimes leading to the shooting down of the convict, a waste of life without necessity, and so without right.

Larceny, burglary, and injuries to the person, particularly the first, are the most common forms of crime; ignorance, intemperance, idleness, poverty, and want of early training, are the predominant causes.

Two years ago Governor Davis, in his annual message to the legislature, urged a thorough reform of the prison system of the State, but no legislative action was obtained. Within a few weeks past great public interest has been aroused by a thorough exposure, in a public lecture, delivered at the State capital, of the enormities of the existing systems, both jail and penitentiary, from which has resulted the formation of a "prison reform association of the State of Texas," one of the avowed and leading purposes of which is "promoting such legislation as shall reform the present prison system and discipline of the State."

The membership of this association embraces some of the best and most influential men of all parties in the State, among whom are its highest officials, the governor, the secretary of state, the State treasurer, the attorney-general, the comptroller, and the judges of the supreme court;

also, some of the most influential members of the bar from different parts of the State. The newspapers of the State, without regard to party, are also earnest in the advocacy of reform, and much of hope lies in the future of this association.

This association has already prepared and proposed to the legislature the passage of three separate bills. One of these bills provides for a complete re-organization of the county-jail system of the State; another provides for the erection of a new penitentiary, to be conducted substantially on the Crofton system; and the third proposes for each county in the State a "county farm," with poor-house, house of correction, and reform school. All the above bills were referred to committees. Favorable action is hoped upon some of them at once, and upon all in time. The urgent need of reform in all these points may be inferred from the statements made in this report, and also from those contained in the following extracts from a communication made to the legislature by the writer of the report, and which is hereto appended as a part of his statement:

It is believed that no other civilized State upon the earth has so terrible a jail system as ours. The hundred jails in this State are to-day a hundred dens of suffering, crime, and infamy; a hundred schools of poverty, vice, and shame; a hundred plague-spots upon the body politic, and a hundred sources of disgrace to morality, to religion, to the State. And it were well if this were all. But, with nearly a thousand penitentiary convicts, we have to-day accommodations for only two hundred and eighty-eight; and, again, with thousands of suffering paupers there is not a poor-house in the State. Again, with thousands of children, orphans, and outcasts falling into crime, we have not one single house of correction or reform.

Why is this? It is a well-established law of political economy that humanity itself is of the greatest value to a State, and that a careful regard for it is a State's first duty.

What is being done for humanity here? Where does Texas look for her future prosperity? Is she willing to risk the experiment of letting poverty and suffering, the very parents of degradation, go on unnoticed and unchecked?

All these things are in your hands, gentlemen, and may not the good citizens of the State hope that, among the four hundred bills before you, the two or three looking to the suppression of suffering and crime may be deemed worthy of notice?

24. VERMONT.

By Rev. Franklin Butler, chaplain of the state prison.

Vermont is an inland, agricultural State, containing an area of only 9,056½ square miles, or 5,795,960 acres, and having a population of 330,551 in 1870. The Green Mountains extend through the entire length of the State, dividing it from north to south into two nearly equal portions. It has only two incorporated cities, and but few towns in which the number of inhabitants exceeds five thousand or even two thousand souls. It is eminently a rural commonwealth, in which there are no great centers of influence of a social, moral, or political nature.

Vermont has three colleges and an academical and common-school system, of which, although perfection is not claimed, her sons are never ashamed to make mention.

In Christian churches she abounds, and in her men and women trained up in her mountain homes, she, if any State, may glory. But, despite these advantages, here, as elsewhere, vice and crime exist; and the demand for earnest attention to the prevention and cure of the same is most imperative and urgent upon Christian patriots and philanthropists.

In attention to this latter point, Vermont has not much whereof to

boast; and, indeed, it may as well be plainly confessed that, herein, she is considerably in the rear of some of her younger sisters.

The penal and reformatory institutions of the State are: I. The state prison; II. The county jails; III. The State reform school. To these may be added, as institutions bearing directly upon the prevention of crime: IV. The home for destitute children, at Burlington V. Other preventive institutions.

I.—*The state prison.*

This is situated at Windsor, and is the first and only one ever built in Vermont. It was completed and occupied in 1809, eighteen years after the admission of the State to the Union. Previous to that time, such temporary expedients for the public safety and the punishment of offenders were adopted as were deemed practicable for the unsettled civil and political condition of the people. The building, 84 feet long by 36 feet wide, three stories high, was constructed of granite, the outside walls being 3 feet thick, and the partitions of apartments into which it was divided being 18 inches in thickness. The rooms were made for the occupation of several convicts at a time; and they were lighted, in the first and second stories, only by a small aperture in each for the admission of light and air. This building was considered large enough for 170 inmates. Adjoining it, a building 54 by 24 feet, and four stories high, of stone and brick, was erected for the use of the keepers and guards. Walls of hammered stone and brick, 20 feet high and 4 feet thick at the base, inclosing a yard 16 by 12 rods square, were also raised. Within the yard was a workshop, 100 by 24 feet, and three stories high.

In 1832 a new cell building was constructed, containing 136 cells, each designed for one prisoner. It has, however, been since re-arranged, and the cells so enlarged as to reduce the number to 104. This building is appropriated to the men, while the upper part of the old structure is used for the confinement of women.

From 1809 to 1872, 2,101 persons have been committed to this prison, averaging a little more than 33 per year, the commitments of 1809 being 24, and those of 1872 being 32, and the population of the State being respectively 217,895 and 330,551. The highest average term of sentences, less than life, during this period is six and two-third years, in 1809, and the lowest is two years, in 1867, while the general average is a little over three years. Nineteen have been sentenced for life. The pardons number 724, the greatest number having been in 1821, when it equaled the number of commitments, viz, 27. The least number was zero, for neither in 1809 nor in 1842 were any pardons granted. The escapes, in the sixty-three years, amount to 26, being less than one in two years. The death rate on the whole number has been a little more than one-third of one per cent.; on the average number about one and one-third per cent.

The practice of industrial labor has always been regarded as of primary importance, as well to the interests of the inmates themselves as to those of the State. Various kinds of labor have been pursued, both on contract and under the management of the officers. At present the work is exclusively ladies' gaiters, on contract, at 70 cents per day, which yielded to the State, in 1872, an excess of income above expenditures, amounting to \$3,654.31, and there is a fair prospect that the excess will exceed that amount for some time to come.

The discipline is in the hands of the warden, who administers it with

mingled kindness, firmness, and justice. Solitary confinement in a darkened cell generally suffices for correction, although the block and chain are in rare cases found necessary. As an inducement to good behavior, a commutation law has been enacted by the legislature, by which an abatement from the sentence for good conduct may be made, by the governor, on recommendation of the superintendent. This law has had a most benign effect upon the inmates.

Secular instruction to the inmates is not required by law. More or less, however, according to the circumstances, is given in some form, by the chaplain or other officers. A library of nearly 500 volumes is provided, and an annual appropriation is made for its maintenance and increase. To this, all who can read have access.

Religious instruction is provided for in the chaplaincy, the duties of which are those usually appertaining to the office of the minister of the gospel in preaching the word, visiting the sick, instructing, counseling, encouraging, and helping, with the truths of religion, the erring and fallen, to self-respect and self-conquest. He holds regular religious services every Sabbath, and performs such other labors as the varying circumstances require. Music being regarded an important aid to reformation, its use in worship and its practice for that end are encouraged in all who have any aptitude for it.

No provision is made, either by the State or by organized private benevolence, for aiding convicts to employment and usefulness on their discharge. The superintendent, in accordance with established custom, provides a decent suit of clothes for them, and gives them a small sum of money to help them to leave the place, but nothing more is usually done in the name of the State. Individuals, in a quiet way, often help them to employment, or afford other aid.

II.—*The county jails.*

There are fourteen counties in Vermont, with a jail in each. They generally consist of one or two large rooms and a few cells, designed for transient safe-keeping of persons arrested, and for the punishment of those convicted of minor offenses, and sentenced to a few days or a few months of imprisonment.

In some of the jails religious meetings on the Sabbath are regularly held by Young Men's Christian Associations or other organizations, but this is by no means the case in all.

Some effort has been made to induce the legislature to make careful inquest into the condition and administration of the jail system, or rather want of system; but, as yet, no practical results have appeared. They are still mere tarrying places for the guilty or the innocent, as the case may be, in which a brief confinement often proves, through association with hardened criminals, the introduction to life-long crime. Governors have called attention to the subject, editors have discussed it, and intelligent citizens have expressed their opinions; but no steps have yet been taken toward improvement.

III.—*The State reform school.*

In 1865 an act was passed, establishing a State reform school. It was organized on the family system, but has been changed to the congregate. None are admitted who have passed the age of sixteen. Both sexes were at first received; but that plan was not found to work well,

and at present only boys are received. Originally the law allowed sentences ranging from six months to "during minority." Experience demonstrated the inexpediency of this provision, and now the latter is the only sentence; but the authorities have power to discharge conditionally whenever, in their judgment, it may be wise to do so. It is essentially a *preventive* institution, being designed rather for vicious and neglected children than for those actually criminal. Although, from the shortness of the time during which it has been in operation, large results have not yet appeared, enough has been accomplished to justify the outlay of labor and money expended, and to give promise of a rich harvest in the coming years.

IV.—*The home for destitute children.*

The home for destitute children, at Burlington, was founded in 1865, mainly through the efforts of Miss Lucia T. Wheeler, daughter of the late President Wheeler, of the Vermont University. During the first six months twelve children were received. It was opened in a private house; but as the number of applicants soon exceeded the means of accommodation the marine hospital building was purchased, in 1866, and devoted to the uses of the institution. A permanent fund of \$50,000 for the home is nearly completed. Originally the institution was designed chiefly for destitute children of Burlington, but it is now open to those of all parts of the State. It has been in successful operation for seven years, under the efficient management of an association of benevolent ladies. During this period, it has received 170 children; of whom 79 have been provided with homes in private families, chiefly in this State. Some of them have been legally adopted, and others bound out until eighteen years of age.

The working force of the "Home" is composed of a matron, a teacher, a seamstress, and a cook. The school is regarded as equal to any public school of like grade. During the year 1872, twenty-eight have been received; nineteen have been provided with homes; and several, having reached their majority, have been discharged. The present number in the home is thirty-five. The value of this institution, as a preventive of evil and an agent for good, can scarcely be computed, and its friends may well rejoice in the success of their noble work.

V.—*Other preventive institutions.*

There are one or two other institutions or schools in the State for the young, similar in nature and object to the home at Burlington, originated and sustained by Roman Catholics; but, having no definite information concerning them, I am unable to do more than state the mere fact of their existence.

Conclusion.

Such is an imperfect sketch of the penal and reformatory institutions in this State. The facts are submitted in the belief that if, in some things, Vermont falls in the rear of some States in the great enterprise of true prison reform, it is not by reason of the lack either of eyes to perceive her deficiencies, or of head to find the remedy, or of heart to press the application. Vermont may be in the rear, but she is not asleep.

25. WISCONSIN.

By Samuel D. Hastings, secretary state board of charities and reform.

The State of Wisconsin contains a population, according to the United States census of 1870, of 1,054,970, of which number 690,471 were native and 364,499 foreign-born.

The State is divided into fifty-eight counties, forty-nine of which have jails, in which persons awaiting trial charged with crime and those convicted of minor offenses are confined.

In most of the counties the jails are small and insecure, deficient in ventilation, with no facilities for bathing, with no arrangements for a proper classification of their inmates by which the young lad, confined for some petty misdemeanor—his first offense—can be separated from the old and hardened offender, and are so managed that the prisoners are compelled to pass their time with no employment other than to corrupt each other and to devise plans for future depredations upon society, and with nothing done with a view to the reformation or the intellectual or moral improvement of the prisoners. Within the past few years a few good buildings have been erected, free from some of the defects alluded to above. The buildings have been made comparatively secure; good ventilation has been attained; in one or two cases bathing facilities have been provided, and better arrangements for classification have been made; but, after all, glaring defects still remain.

The aggregate number confined in the forty-nine jails of the State during the year 1870 was 1,502; the aggregate number in 1871 was 1,456; and the number in the jails on the 1st day of August, 1872, 166. The time of confinement varies from a single day to a year or more.

Of the number in the jails on the 1st day of August, 1872, 60 were insane, confined there for the lack of a better and more appropriate place in which to put them. A second state hospital for the insane is now nearly completed, and, when opened, the insane will all be removed from the jails.

The most important reformatory institution in the State is the Industrial School for Boys. The following interesting account of this institution has been kindly prepared by Mr. A. D. Hendrickson, the superintendent:

This institution was opened at Waukesha in July, 1860. In his opening address Mr. Cogswell appropriately said: "Wisconsin inaugurates to-day the noblest of her institutions—penal, reformatory, educational, or charitable." This institution was first known as the house of refuge, but the legislature changed its name to reform school, and still later, in 1871, to Wisconsin industrial school for boys. Girls were originally admitted. Recently an act has been passed to exclude them.

The number of boys, from the commencement to January 1, 1873, covering a period of twelve and one-half years, is 832; total number of inmates of both sexes, 905.

The control of the institution is in the hands of a board of five managers, appointed by the governor for a term of three years. The board elects the superintendent and matron, who hold their office at its pleasure. The superintendent names all the assistants, subject to the approval of the board.

Boys are committed to the school between the ages of eight and sixteen years, as vagrants, or on conviction of any criminal offense, or for incorrigible or vicious conduct.

The managers have power to return any inmate to the care of his parents or guardian, or provide a home elsewhere, whenever in their judgment such disposition would be most for his future benefit; but unless he has reached his majority, his discharge is conditional, and, in case of misconduct, he is returned to the institution. Such returns will not average more than 5 to 7 per cent. This watchful supervision of the boys after leaving the school is of very great value. It is a kind of parental oversight, which operates as a constant restraint.

The average stay in the school is between two and three years. While a few are

discharged within three or four months, some remain six or seven years. The latter are generally those who have no homes outside, and, as a rule, they are the best fruits of our work.

The total current expenses of the school for 1872 were \$36,588.70. Of this sum the earnings of the boys amounted to \$6,351.06, two-thirds of which were the product of a farm of 233 acres, and one-third was the result of work in the shops.

This institution was first organized on the congregate system, and so continued until the main building was destroyed by fire, January 10, 1866. The institution was rebuilt on the family plan the same year. We have now a main building, containing school-room and residence of superintendent, and six family buildings. Each of these latter is designed to accommodate thirty-six boys, but want of room sometimes compels us to crowd forty or more into them. There are two stories above the basement. Each is provided with a boys' sitting-room, bath-room, and storage-room on basement floor; dining-room, library-room, and officers' sitting-room on first floor; and dormitory, dressing-room, and officers' lodging-room on second floor.

We have now been working under the family system for more than five years, and there is no wish to return to the congregate plan. Then the boys were locked in separate cells at night, confined within close yards by day, and strictly guarded at all times. Now each family lodges in a common dormitory, which is well lighted and well ventilated, with no more bolts and bars than are needed in common dwellings. Our grounds and surroundings are open, pleasant, and homelike.

From eight to nine hours of each day are devoted to active employment, about equally divided between labor and school. Our employments are farming, gardening, shoe-making, tailoring, broom-making, willow-ware making, cane-seating, knitting, and domestic work. A principal and four assistant teachers are employed in giving scholastic instruction to the boys. The common English branches are taught; also history, physiology, and occasionally other branches of natural science and mathematics. Religious instruction is regularly imparted, but without denominational bias. No regular chaplain is provided. Ministers of different denominations officiate. In the absence of such, the superintendent conducts the religious services. Besides public worship on the Sabbath, a Sunday-school is regularly maintained. All the inmates assemble daily in the chapel for public prayer. A library of 800 to 900 volumes, and a generous supply of magazines and papers, adapted to the ages and capacities of our boys, constitute the reading matter provided.

Vocal music is cultivated with very satisfactory results. For the past four years we have maintained a brass band, which has been a source of much gratification, and is found useful as well as ornamental.

The most serious difficulty which this reform work has to contend with is the lack of the whole-souled earnest men and women to take the position of house-fathers and mothers, to educate and train up these young wayward sons of the west in the way in which they should go.

The State is doing its part in this noble work, but there is a part that the State, unaided by individual effort, cannot do. Here is work for the Christian and the philanthropist. The missionary may here find a field of labor without crossing the seas; a field of labor that will prove remunerative to both the teacher and the taught. Here he can snatch a fellow-being from the brink of crime and infamy, and send him out into society a good man, an honest citizen. He may save a soul from death, and hide a multitude of sins.

The following report on the state prison has been kindly furnished by the Hon. George F. Wheeler, state prison commissioner:

The Wisconsin State prison, at Waupun, was opened to receive convicts in the spring of 1852. The whole number imprisoned here since the opening has been 1,718. The average number at present is something less than 200.

The administration of the prison is in the hands of a commissioner, who is elected by popular suffrage biennially. He appoints all subordinate officers, and has full control of the business and discipline of the institution.

The conduct of the prisoners is, with few exceptions, good. It is the aim to maintain the discipline by kind measures rather than by harshness, and a resort to the severest punishment (confinement in a dark cell) is rarely necessary. A strong incentive to good conduct is the shortening of the term of service as a reward to good behavior.

The governor has the power of pardon, but in order to its exercise he must have a certificate from the prison commissioner stating that the conduct of the applicant has been good during confinement; and, in case the convict has been sentenced for murder, he must also have the recommendation of the judge who tried the case.

A school is maintained by the chaplain of the prison, in which from one-fourth to one-third of the convicts receive instruction on Sunday afternoon in the common-school branches. Although a large proportion of the prisoners are recorded on entrance as able to read and write, yet their knowledge of even these rudimentary branches is very slight, and the school has wonderfully improved very many of them. In addi-

tion to the school, there is, as a means of instruction and amusement, a library of about five hundred volumes.

The convicts are employed, under the management of the administration, in several kinds of mechanical work. They cut stone, manufacture cabinet-work, and make chairs. For this last work, which is carried on to even a large extent, the prison has very complete shops and machinery. Shoemaking and tailoring are also carried on in the prison. Besides this, the prisoners do all the necessary work of the establishment.

The sanitary state of the prison is good. Notwithstanding the fact that many of the convicts are received in a more or less diseased condition, incident to a vicious life, or are debilitated by close confinement in jails, the average health is as good as it is outside.

The most common cause of crime is drunkenness, which often, perhaps usually, accompanies idleness.

The State employs a Protestant chaplain, who gives his time entirely to the institution; and there is also a Catholic chaplain, who makes monthly visits for the benefit of the adherents of that faith. In addition to the duties proper of the regular chaplain, he has the direction of the school and is in charge of the library. In his efforts for the moral and spiritual improvement of the prisoners, the chaplain has the assistance of volunteer laborers from among the philanthropic citizens of the village.

In addition to the state prison, jails, and the industrial school for boys, we have an institution in the city of Milwaukee, known as the Milwaukee house of correction. This prison is for the reception and treatment of vagrants, disorderly persons, able-bodied paupers, and persons convicted of minor offenses. The inmates of the house of correction are kept at work in association by day under the rule of silence, and sleep in separate cells at night. The whole number imprisoned in 1872 was 647, and the average number during the year was 68. The number discharged was 579, of whom 514 were men and 65 women; 177 were natives, and 402 foreigners.

With a population of over twelve hundred thousand, the average number of inmates in the State prison was during the past year but	200
The number of persons confined in the jails of the State on the 1st day of August last, deducting the insane, (which is probably a fair average for the year,) was.....	106
The average number in the Milwaukee house of correction during the year was.....	68
Making a total of	374

Is there any State in the Union that can show a better record in proportion to its population?

The following extract from the recent message of Governor Washburn to the legislature will be interesting in this connection:

There is no subject more worthy of the careful attention of the legislature than that of our penal institutions. The best of men have been divided in opinion as to the best methods of treatment for the vicious and criminal portions of society. For some years past more attention has been given to the reformation of our criminal classes than formerly, and punishments have assumed a less vindictive character.

In July next twenty years will have elapsed since the death penalty was abolished in this State. The experiment met with strong opposition from a large portion of the people of the State who predicted that a large increase of crime would result from the change. That prediction happily has not been verified, and the facts which I am about to state conclusively show that no State in this Union can boast greater exemption from crime than Wisconsin. With a population of 1,200,000, representing almost every nationality, and two-fifths of foreign birth, statistics show that crime, instead of increasing with the growth of the State, has actually diminished. This is in a great degree due to a high-toned public sentiment, which causes the violated laws to be promptly vindicated.

Since the abolition of the death penalty, there have been tried, convicted, and sentenced to the penitentiary for life, 71 person in all. Of that number, 36 now remain, the rest having either died, been pardoned, or discharged by proper authority. There can be no doubt that the change in the law has rendered punishment much more certain, and I but express the opinion of those who have most carefully consid-

ered the question, as well as my own, when I state that but for that change in the law, at least one-half of those heretofore convicted would have escaped all punishment, so difficult is conviction when the penalty is death. In the five years that elapsed from 1848 to 1853, I have no knowledge of more than one person having suffered the extreme penalty of the law. This was not because of lack of offenses, but of the extreme difficulty of conviction.

In the year 1854, the number of convictions for the crime of murder was three; in 1855, three; in 1856, three; in 1857, three; in 1858, five; in 1859, none; in 1860, two; in 1861, none; in 1862, two; in 1863, eight; in 1864, none; in 1865, five; in 1866, one; in 1867, four; in 1868, five; in 1869, two; in 1870, four; in 1871, three; in 1872, one. I have taken some pains to learn what the conduct has been, since discharged from prison, of those convicted of the crime of murder who have been pardoned, and I have failed to learn of any instance where the party had rendered himself amenable to the law. On the contrary, so far as known, they have proved honest and peaceable citizens—extremely careful and circumspect in their intercourse with their fellow-men.

TERRITORY OF UTAH.

By A. P. Rockwood, warden of the Territorial penitentiary.

For about sixteen years my attention has been officially called to the manner of executing the sentence of the court on convicts committed to the Utah penitentiary. My experience has been five years as inspector and eleven years as warden.

Laws are supposed to be made to fit the circumstances under which they are to be administered; the laws applicable under one set of circumstances may not be under another. In Utah we have no intermediate prison or house of correction created by the territorial statutes; consequently, the law endows the warden with large discretionary power. Under its provisions he is authorized, with the approval of the directors, to hire out any or all of the convicts on any public or private works. As we have no house of correction for juveniles, all persons convicted of high crimes or misdemeanors are sent to the penitentiary. Under the provisions of the law, I exercised my discretion in the classification of the convicts.

The first class consists of old offenders or desperadoes, who may be generally considered past reclaiming. These, however, as well as all others, I endeavor to govern by kindness, and to create within them the sentiment of hope, without which the heart faints. I cannot better illustrate this point than by relating a circumstance that occurred some years since. Two of this class were arrested for horse-stealing, and, for want of bail, were committed to the county jail to await trial. While there they boasted, in presence and hearing of the keepers, of what they would and would not do when they were committed to the penitentiary, all of which soon came to my ears. This enabled me to prepare for them. In the early part of June they were delivered into my hands. I bade them make themselves comfortable and contented, and they would be properly cared for. When supper-time drew nigh, I asked them if they were fond of bread and milk. They made answer that they were very fond of it, but had not had the luxury for several years, adding that it would remind them of their childhood home, when mother used to serve it out. Soon I went in with the coveted meal, and with it a bowl of strawberries. They fairly laughed for joy. Next morning beefsteak, vegetables, bread, and milk were served for breakfast, the sight of which made their hearts again leap for joy. Next came the assignment of the labor which they had sworn not to do; nevertheless they receded from their vow, and quietly commenced. When all was suitably arranged, and I was about to withdraw, I cautioned the superintendent, in their hearing, not to work these men too hard, as they had been shut up in the county jail for several weeks, and were not used to the

scorching rays of the sun, and their hands were tender and not recently accustomed to the handling of rough tools, like our picks and shovels. I then stepped into my carriage and drove off. In the evening the superintendent reported that the day had passed off quietly, and that the work had progressed well. At the close of the day these convicts inquired of the others if this was the way they were treated all the time. They were answered in the affirmative, and assured that the warden would be as kind to them as a father. The next day being Sunday, I went in and inquired after the welfare of each convict. At length I came to the two in question, and spoke a few kind words to them. They commenced sobbing, which was followed by a flood of tears, and a voluntary confession of what they had said when in jail. They promised that I should have no trouble with them. Kindness had melted and subdued them. If men so hardened can be conquered by kindness, who shall be despaired of?

The second class consists of prisoners of mature age, who, under the baneful influence of liquor or momentary passion or sudden temptation, have, in an unguarded hour, committed some criminal act. Criminals of this class are frequently reclaimed, and are sometimes hired out, as those are who are immediately to be mentioned as belonging to the next class.

The third class includes the youth, who are not hardened in crime, nor have their hearts yet been seared so that they are not subjects of reform. To this class my attention has been particularly directed, and, as authorized by law, I frequently hire them out to a parent, brother, or friend. When application is made for a convict of this class, I must have three guarantees before hiring him out. I must be convinced first that the convict is safe from assault by persons who would seek revenge for past offenses; secondly, that the person offering to hire him may be safely intrusted with the execution of the sentence; and, thirdly, that the convict's word of honor can be confided in. If satisfied on all these points, I lay the matter before the board of directors. If they approve, the contract is entered into; if not, all remains in *statu quo*. One condition of the contract is that the employer shall suitably feed, clothe, guard, and meet all other charges that may be incurred in the execution of the sentence, and pay to the warden the amount set forth in the agreement. A second condition is that he shall see that the convict abide under the rules of the institution, as far as they may be applicable. A further condition is that the convict shall be returned on the order of the warden, without the necessity of assigning any reason therefor. All these stipulations and some others having been entered into, the employer is appointed deputy warden, and files a bond with security for the faithful performance of his duties in the execution of the sentence on the convict committed to his custody. Under this mode of procedure the convict is placed, so to speak, under the care of a father, brother, or friend, besides remaining still under the watchful protection of the warden, who has power to order him returned at pleasure.

Now for the practical working of this system. About four per cent. have proved recreant to their trust; ninety-six per cent. have been in a measure reclaimed; fully one-half have settled down to be good citizens; and the balance have passed off to parts to me unknown. Suffice it to say that not one of this class has been committed to my custody for a second offense.

Having said this much on the subject of discipline and reform, I now proceed to the preventive measures employed in Utah. First, our license law is nearly tantamount to prohibition, especially in small or thinly

inhabited settlements. Secondly, the Territory is subdivided into about one hundred and seventy wards, or precincts, nearly all of which have an organized female relief society, whose business it is to look after and supply the needs of the poor and the children that are not suitably cared for. These societies are exclusively managed by the ladies; all aid rendered is by voluntary donation. The higher aim of the society is to prevent children being brought up under demoralizing influences, and to direct the juveniles in the paths of virtue. Parents and guardians, not willing to accept the proffered aid, are free to take their own course, so far as the society is concerned. Thirdly, by an act passed by the legislative assembly in 1853, the probate court of each county is authorized (on complaint that there are in the county minor children who are not properly brought up) to issue an order to a proper officer requiring him to bring said child or children before the court, and summon the parents or guardian, as the case may be, to appear and show cause, if any they have, why said children should not be bound out to suitable persons under the provisions of the statute.

Most of the citizens of Utah are partial to large families; consequently there is not much trouble in procuring suitable places for children in the most respectable families, with little or no cost to the county.

The salutary effects of these preventive measures are visible in the streets of our cities by the absence of prostitutes walking, mincing, and tinkling as they go, designing to lead the unsuspecting youth from the path of virtue. As yet no female convict has been committed to my custody, nor to the custody of my predecessors in office.

V.—PROCEEDINGS AND DISCUSSIONS.

[Reported by Rev. William H. Tiffany.]

The proceedings of the first day consisted simply of what was done at the opening session, which has been already reported in a former part of these transactions.

SECOND DAY—MORNING SESSION.

WEDNESDAY, *January 22, 1873.*

The congress re-assembled at 10 a. m. in Raine's Hall.

In the absence of the president, the Rev. Dr. Bellows, of New York, one of the vice-presidents, called the meeting to order.

Prayer was offered by the Rev. Thomas K. Fessenden, of Connecticut.

Judge Walker, of Michigan, chairman of the business committee, moved that the congress hold two daily sessions, viz, from 10 to 3 in the morning, and from 7 to 9.30 in the evening. Carried.

The annual report of the standing committee on prison discipline was read by Dr. Wines, in the absence of Z. R. Brockway, of Michigan, chairman, detained by sickness. (For the report see page 331.)

The report of the standing committee on discharged prisoners was read by Mr. Allinson, of New Jersey, chairman. (For the report see page 336.)

Governor Seymour, who had assumed the chair during the reading of Mr. Brockway's paper, said he hoped that the report, able and satisfactory as it was in most respects, would not go out without some qualification. He feared that it favored restraint too strongly. There was a class of offenders, called "rotary men," appearing often before the courts and

in prison, who needed to be sharply dealt by; but he was afraid of police supervision. Virtue could not be made by coercion. He had an abiding belief that there was good in every man, and that this should be sought out, encouraged, and developed. The number of pardons granted by him during his four years' administration as governor of New York had been made matter of reproach. With him it was rather an occasion of gratulation and pride. He believed that very many reformatations had been thus effected. He had witnessed many touching instances of gratitude, and one which, though perfectly sincere, had an air somewhat ludicrous. He had extended clemency to a poor fellow who, in expressing his thanks for the favor, said: "Governor, I hope to be able to do as much for you some time." Another consideration: he thought there was too prevalent a desire to make our prisons not only self-supporting but sources of revenue, and that the report gave too much countenance to this feeling. He believed in making prisoners work and earn money; but he believed also in giving them a share in their earnings, and a pretty large share too. Labor so performed would be far more valuable to the prisoner, for it would be willing, cheerful, and hearty; and it would tend to beget a love for work and to form the habit of industry. What he wanted was the reformation of the criminal, and he believed that this would be better effected by kindly care than by excessive coercion and restraint. But he would not close without saying that, despite these criticisms, he regarded the report as an excellent one, and thought it contained many valuable suggestions.

Dr. Wines agreed, in the main, with what had fallen from the president, but thought he had attached too strong a meaning to some expressions in the report. He was quite sure that there was no man in this congress who felt more strongly for the prisoner, or acted more wisely on his behalf, than Mr. Brockway in the management of his prison at Detroit. As regarded police supervision after discharge, it was not much known in this country, and doubtless there was a strong feeling against it; but it was a question worthy of being studied. It was discussed in the London Congress. The continental delegates opposed it as harsh and injurious as practised among them, but approved of it where, as in England, it was of a friendly character and designed to shield and help the convict. When so practised, they thought it wholesome and beneficial. It was, however, applied in England only to "habitual criminals," whom Governor Seymour had described as "revolvers," and in reference to whom he had admitted that "restraint" might be salutary.

Mr. H. Thane Miller, of Ohio, heartily indorsed what the president had said, and thought the congress would do the same. The diamond sentiment of his address last night was, that criminals "needed a spirit to guide, and a Saviour to atone." That was true. The only hope for the criminal was in a change of heart; and therefore, officers having them in charge should be men of God. More care should be had in the instruction of convicts, in setting them good examples, and in pointing them to the Saviour and the Holy Spirit for salvation and sanctification. The reading of the convicts was also important. He believed in the idea expressed in Mr. Brockway's report, that there should be a compulsory law to have the children of the convict and all children sent to school.

As regarded the second report, read by Mr. Allinson, on discharged prisoners, he believed that great good would be accomplished by the practical application of its suggestions. Convicts must be helped when they come out of prison, not only with good advice, but money or its equivalent. They must be aided in getting work. More than fifty discharged from the Ohio state prison last year had had employment

furnished them, to the equal benefit of themselves and the community. He hoped that all would carry the spirit of that report to their homes.

Mr. Albree, of Pennsylvania, had visited Mr. Brockway's prison, and spoke of it in terms of warm commendation. He thought terms of imprisonment should be made longer, so that there might be time for reformation, and for the successive steps which that work required. Prisoners needed sympathy and love, and these should be shown in person, not by proxy. He was a director in the Allegheny County workhouse, of which Mr. H. Cordier was warden. The institution was started only a few years ago. It was conducted on reformatory principles, and promised great success.

Dr. Wright, of Tennessee, expressed warm approval of both reports, and thought the congress would indorse them.

Colonel Burr, of Ohio, did not desire to occupy the time of the congress. He only wished to say a word on one or two points. He had been in charge of a prison having an average of a thousand men, and knew something of the matters discussed here. The idea had been thrown out that officers looked down upon prisoners as a lower order of beings. This might be so in some cases, but it was different from his own experience and practice. He forgot that they were prisoners, and looked upon them as brothers. There was but one thing that would really and radically reform criminals, and that was the Christian religion, the regenerating power of the Holy Spirit, and salvation through the blood of Jesus. He thought that police supervision would not do in this country, nor had he much faith in the idea of indefinite sentences, as suggested in both reports. The great difficulty with discharged prisoners was the idea of their having been *convicts*. If they tried to conceal the fact, they were sure to be found out and *crushed*. Police supervision he thought would add to this load. Put some trust in the prisoner, and thus beget in him the desire to lead a better life; this will inspire hope and prompt effort to deserve your confidence.

Dr. Bellows, of New York, was sorry to see any conflict introduced here. He was much struck with the independence of Mr. Brockway. Independent men are men of strength. They often combine opposite traits, and are capable of high thought and great action. He regretted also to see a conflict between theory and practice. This was illogical and unnatural. All right practice is based on sound theory, and all just theory is the child of correct practice. A war between theory and practice was therefore an internecine war. Let us put heads and hearts and hands together, and make a perfect man. Another thing he was sorry to see, namely, a conflict between prison reformers and society at large, as if society was not in favor of true reform. Society was reformatory; and the whole prison system did not begin to compare in conservative and reformatory power with the great natural laws of society itself. Men were stayed up by public opinion, by a sense of decency, by the desire to stand well in the community, and the like.

Rev. Mr. Milligan, of Pennsylvania, was opposed to police supervision of discharged prisoners. What we wanted for prisoners as well as others, was the atonement of Christ and the spirit of love. He had helped a great many discharged prisoners, spending hundreds of dollars this way; and only one man, thus aided, had ever proved false to the trust reposed in him.

The Rev. Mr. Woodbury, of Rhode Island, read a paper by Dr. Clarke, of Massachusetts, who was unable to be present, on "The final cause of criminal legislation as affecting modes of punishment." (For this paper see p. 370.)

Dr. Wines, of New York, read a "Summary of the views and suggestions contained in the report for 1872 of the Board of Public Charities of Pennsylvania," sent by Mr. George W. Harrison, president of the board. (For this paper see p. 367.)

Dr. Wines said that one fact had struck him forcibly, viz, that all the four papers read this morning—Mr. Brockway's, Mr. Allinson's, Dr. Clarke's, and Mr. Harrison's—had contained approving references to the idea that criminals should not be restored to liberty till they gave evidence of being better fitted for citizenship than they were on entering the prison; and a paper would be read this evening, communicated by Dr. Despine, of France, which embodied the same sentiment. Dr. Despine went further, and expressed the opinion that when prisons became real reformatories, as this was their avowed aim, the incorporation of the principle of indefinite sentences in the penitentiary system would be an absolute necessity. All must admit that this principle was just; the only difficulty was in finding a right way to apply it. But he believed the problem capable of solution, for he held that God never made a truth into which he did not put a power which, sooner or later, would cause it to prevail. When the reformation of criminals was sought in *dead earnest*, difficulties would disappear, and our way would be made plain.

General Miner, of Missouri, expressed his opposition to the principles both of indefinite sentences and police supervision.

Mr. Hageman, of New Jersey, expressed concurrence in these views.

Mr. Richard Vaux, of Pennsylvania, advocated the same side of both these questions with the last two speakers. He had the greatest possible respect for Mr. Brockway. He was behind no man in admiration of his ability and success as a prison officer. Possibly his views might be applicable to the locality where he lived and worked. But what might be true in Michigan would not be true in Philadelphia or New York. Police supervision extended the prison beyond its walls. He would say, with entire respect, that New York had, in its prison at Sing Sing, a gigantic manufactory of crime. Criminals were there educated to go out and rob with greater skill and success. In the city of New York the rogues were stronger than the whole power exerted to keep them in subjection. Hence there was failure in the courts, judges and juries often conniving or winking at wrong. Mr. Brockway's plan would vastly increase the police force in New York, requiring a cordon of policemen around each block in the city. What was applicable in England would not be permitted in this country. The prolongation of the prison, after the prisoner has gone forth from its walls, would not be tolerated among us. The most important suggestion was that we hold out hope to the prisoner. Reform should be the end in view; and hope should be held out from the beginning.

Mr. Bradford, of Connecticut, said that he took square issue with the last speaker; he believed that we should have supervision of the discharged prisoner, if it was of the right kind. None could object to the continued supervision of a kind father after his son had left the paternal roof. This was the kind of supervision that discharged convicts needed.

Mr. Coates, of Pennsylvania, was against the idea of indefinite sentences, and denied the right of society to exercise supervision after the prisoner had served out his time.

The Rev. Mr. Fessenden, of Connecticut, read a report on the preventive, reformatory, and penal institutions in that State. (For this report, see p. 379.)

Dr. Wines read a report on the prison question in California, which

had been prepared and forwarded by the Rev. James Woodworth, secretary of the prison commission of that State, who was unable to attend in person. (For this paper, see p. 375.)

Dr. Bellows, of New York, asked for information as to the training of the girls mentioned in the report of Mr. Fessenden, whether the causes of crime in their cases were inquired into, and whether the treatment was specially adapted to each case. He spoke in strong commendation of Dr. Carpenter's essay on unconscious cerebration, and wished to ascertain whether the treatment of the girls referred to was based upon the truths contained in that book.

Mr. Fessenden explained that the points presented in the inquiry of Dr. Bellows were made matters of examination, and the treatment was controlled by the result. But they found that clean clothes, good water, and plenty of soap made a wonderful change. One of the girls, after she had shed her coat of filth, came out as handsome as a "picture." A police officer said to him of another of the girls, "If you can make anything of that girl, you can reform any one." Yet she is a good girl. Our success is very cheering in this work.

Mr. Janney, of Maryland, referring to statements made in the two reports read, said he rejoiced that temperance was making some progress. The fact that nine-tenths of the crime committed could be traced to intemperance, showed that effort should be made to promulgate the principles of temperance and to secure their general practical adoption. The offspring of intemperate parents, when they fell into crime, were more to be pitied than blamed.

Hon. Henry Barnard, of Connecticut, said that there was now organizing, in his State, a farm-school, based on the will of Mr. Watkinson, the funds for the support of which amounted to about \$100,000. Mr. Watkinson had also left a small sum to aid discharged prisoners. He quite agreed with the president (Governor Seymour) that a portion of the funds arising from the labor of the convicts should be set aside for their use when discharged.

Mr. White, of Pennsylvania, said that they had established a work-house, a few years ago, in Allegheny County, and that the earnings of the convicts had exceeded their expectations. They made oil-barrels. They gave three cents a barrel to the convicts, who made, on an average, twenty-two barrels a day. A man, committed for two years for petty offense, had earned \$250 for himself.

Colonel Burr, of Ohio, said that in his State they were authorized by the board of directors to place to the credit of each convict, as a reward for good conduct, such sum as they thought fit, not exceeding 10 per cent. of his earnings.

Mr. P. T. Miller, of Missouri, said that his experience as a prison officer had given him some knowledge of this matter. It was no argument to say that a bad man, because he was bad, should make no more money than a better man, because he was better. We should cultivate and encourage industrial skill as well as morality. We should change *coerced* into *free* labor. Money is mighty to move men even in a right direction.

Letters were here received from a number of penal, reformatory, and charitable institutions of Baltimore, inviting the members of the congress to visit such institutions during their stay in the city. The invitations were accepted with thanks.

A recess was taken till 7 o'clock p. m.

EVENING SESSION.

The congress re-assembled at 7 p. m.

The minutes of the previous meeting were read and approved.

The president, with complimentary remarks, introduced Miss Linda Gilbert, of Illinois, who gave an account of her extensive visitation of prisons in different States, in which she communicated a great amount of interesting statistical information. She said that 90 per cent. of all the prisoners in the country were more or less intemperate. The number of county jails in all the States was 2,197, and the average number of prisoners in each jail was about 8. The average number of prisoners in all the prisons in the country did not fall much, if any, below 40,000. Seventy-seven per cent. of the inmates of our prisons never learned a trade. Forty per cent. were illiterate. Thirty-eight per cent. lived out of the family relation, and had no home influences. She said that only parts of trades were usually learned in prisons; hardly anywhere was a full trade imparted. Some thought that criminals could not be reformed; but Mary Magdalene had seven devils cast out of her. There was much mechanical ingenuity shut up within prison walls. She knew of one prisoner whose skill had brought thousands of dollars into the treasury of the State. Her own special work had been to provide libraries for county jails, and she was now engaged in collecting books for the new jail of Saint Louis. Books were the photographed souls that have brightened, and yet brighten, the world. Her belief was that mercy should be mingled with justice, and reform with punishment.

Dr. Wines read a paper on "The Criminal," which had been communicated by Dr. Despine, of France. (For this paper, see page 338.)

Judge Walker, of Michigan, read a report on the preventive, reformatory, and penal institutions of his State. (For said report, see page 411.)

Hon. John F. Hageman, of New Jersey, read a similar report for that State. (For his report, see page 428.)

The president (Governor Seymour) said that the papers just read were now open for discussion. He declared himself in favor of providing discharged convicts with a certificate, engrossed on parchment, with seal, &c., attesting their good conduct during their term of imprisonment. He thought that such a testimonial would be a stimulus to a virtuous life. The first impulse of nearly all men is to turn away from the convict and leave him to his fate. But such a certificate might influence some to throw aside their prejudice, and to aid him in again becoming a good citizen.

Mr. Pierce, of Massachusetts, remarked that something had been said of the demoralizing influence of jails on boys and girls. Many had been struck with horror at seeing small children at such places, intermingled with hardened criminals, who took pleasure in corrupting them, and in preparing them to corrupt society on their release. They had a visiting agency established by law in Massachusetts. The agent and his assistants interested themselves in children charged with violating the law, aided them on trial, and secured them homes. Boys were restless, uneasy, fickle. They needed some friend to guide and guard them; some one whom they could call upon, and from whom they could obtain counsel and aid. It might be asked, How do these boys get to prison? He answered: By the lower courts, which hurried them off to jail, when only accused and not proved guilty of crime, and often not guilty in fact. There was some friction in the system, but it worked the best of

any plan yet devised. Some of the courts sought to break up the agency. But the people had confidence in it, and kept it in motion. It was doing great good.

Mr. Vaux, of Pennsylvania, commented on the paper of Dr. Despine, regarding it as marked by profound thought, keen analysis, and a thoroughly scientific cast, though he could not accept all its views, particularly the part relating to indefinite sentences.

Dr. Wines, of New York, concurred in the judgment just expressed of the ability and value of Dr. Despine's essay. He thought it contained seeds of thought which could not fail to spring up and bear, in the end, a rich harvest.

The congress adjourned till to-morrow at 10 a. m.

THIRD DAY—MORNING SESSION.

THURSDAY, *January 23, 1873.*

The congress met at 10 a. m., Governor Seymour presiding, and was opened with prayer by the Rev. Dr. Smith, of Maryland.

The minutes of yesterday were read and approved. Dr. Wines announced that, through funds proffered for this express purpose, the National Prison Association had been able to issue the complete works of Edward Livingston on criminal jurisprudence, and they offered these incomparable volumes to every person who, by an annual subscription of \$10, became a member of the association.

Dr. Bellows, of New York, said that this congress ought not to separate without an expression of its sense of obligation to that great man to whom penal science owed so much. He therefore moved, and the congress unanimously adopted, the following resolution:

Resolved, That prison science owes an inextinguishable debt of gratitude and commemoration to the great American expounder of the humane principles which have since been acknowledged as the true guide to reformers of penal law and administration; that Mr. Livingston, by his genius and moral elevation, anticipated by half a century the ideas which are now just beginning to prevail among students of criminal and penitentiary science; and that his work is a monument of learning, largeness of thought, nobility of feeling, and practical sagacity—an honor to the country of which he was so distinguished a citizen, and to humanity, to which he was so noble an example.

Governor Seymour said that the resolution of Dr. Bellows did no more than justice to Mr. Livingston in saying that he was the greatest man of our country in so far as penal science was concerned. He believed that he was also the foremost statesman that this country had produced. He had received a copy of an edition in French of Mr. Livingston's work, recently issued in Paris. He therefore moved, as additional to that of Dr. Bellows, the following resolution:

Resolved, That this congress learns with great satisfaction that M. Charles Lucas, a distinguished member of the Institute of France, has published, under the auspices of the Institute, an exposition of the penal code for Louisiana and for the United States, by Edward Livingston, and we are gratified that this work of our illustrious countryman is thus brought to the attention of European countries.

On motion of Dr. Wines, it was ordered that a committee of five be appointed to consider the expediency of making application to the Congress of the United States for aid to the National Prison Association, and to report to this convention.

The chair named for the committee Judge Walker, R. K. White, Edward Earle, Dr. Bellows, and Dr. Wines.

Dr. Bellows presented and read the annual report of the executive committee of the National Prison Association. (For this report see page 321.)

A paper on "Untried Prisoners," communicated to the congress by William J. Mullen, of Pennsylvania, was then read. (For this paper see page 362.)

The chair announced that the two papers just read were open for discussion.

Mr. Powell, of New York, desired to express the great pleasure which, in the main, he had felt in listening to the report read by Dr. Bellows. He, however, took exception to the moral value attached by the report to the dress of women. There was a vast amount of waste, and worse than waste, in this direction. He had lately seen a lady in Washington the flounces of whose dress alone cost \$1,000, and the rest of the dress corresponded in style and expensiveness. This matter of dress was becoming one of the strongest temptations to crime. He favored the dress of Quaker ladies, which was neat and economical, and instanced Elizabeth Fry and Lucretia Mott as illustrations.

Dr. Bellows accepted the criticism, saying that his remarks on the subject of dress were not in the report, but were thrown off extemporaneously in the reading. He took back all that he had said, except the principle underlying his remarks, which he believed to be just and true.

Governor Seymour hoped that the doctor would not surrender too much. He thought the principle involved a powerful means of cultivating and refining the sensibilities. We had better seek to quicken these in prisoners, rather than conquer or crush them.

Mr. Pritchard, of Kentucky, said that for three years past he had had opportunity to witness the working of prisons. They had a most objectionable system in Kentucky. One feature of the system was the leasing out not simply the labor of the prisoners, but the prisoners themselves, to contractors. The system placed the inmates of the prison completely under the control of the contractors. They worked the men for money only, and were sometimes harsh and merciless. Kentucky had lavished millions on other charities, but nothing on the improvement of prison discipline. They needed the warden system, so as to have matters under the control of the State and not that of contractors. He was willing to trust the people, the great mass of whom were right on this subject. With a warden at the head of the prison, and the discipline placed in his hands, they would escape some of the worst features of their present system. It was unwise for the States to *rent* the convicts. He offered a resolution on the subject, which was referred to the business committee.

Colonel Burr, of Ohio, expressed his thanks to Dr. Bellows for his report. We should not only keep alive the sensibilities of prisoners, but, what was kindred to that, we should exercise the spirit and power of kindness instead of mere force. All that Dr. Bellows had said had been verified over and over again in his experience and observation. He had a thousand prisoners under his charge, and his great source of power over them lay in the fact that he was their friend. A single and even a trivial act of kindness would produce great effect.

At this point Governor Seymour called the Hon. Mr. Vaux, of Pennsylvania, one of the vice-presidents, to the chair.

Colonel Burr continued: He said that where force had proved of scarcely any avail, a kind word had accomplished wonders. A Prussian

engraver had been in his prison; he was a very fine workman and much desired by counterfeiters, who would have given thousands of dollars to get him for their work. They provided him with means of escape, drills, &c., and \$5,000, and he readily succeeded, but was caught. He was placed in a cell and expected severe punishment. But when he (Colonel Burr) went to see him, he simply said, "Charlie, put on your coat and go to the shop, to work." The man started, surprised, and said, with tears in his eyes, "Warden, I did not expect this." He walked away, and turned again and said, "Warden, I will never try this again." Again he started, and after going a few paces he stopped a third time, and added, "Warden, you will never have any more trouble with me as long as I am with you." And he was true to his word. That man loved him to-day as one of his own children.

Dr. Wines, of New York, was afraid that the enthusiasm excited by the magnificent paper of Dr. Bellows would draw away the attention of the congress from the modest but very valuable paper of Mr. Mullen, read immediately after it. He hoped that that document would receive the attention which it so well deserved. It set forth, clearly and strongly, the duty of society to persons under arrest, but not yet brought to trial. It showed how much they stood in need of some friendly intervention, and how much suffering and wrong might be prevented by timely and judicious action on their behalf.

Mr. Merrefield, of Maryland, emphasized the remarks of Dr. Wines, and moved that Mr. Mullen's paper be referred to the business committee. Carried.

Mr. Rockwood, of Utah, agreed to all that had been said on the power of kindness. He had in his prison three of the worst "roughs" in that Territory. When first committed, they threatened vengeance, and declared their purpose to escape. He gave them bread and milk, with strawberries, for their breakfast, and took them out on the road to work. On leaving them he instructed the overseer not to work them too hard, as their hands were soft and would blister. The other prisoners told them that if they behaved well they would be kindly treated. Next Sunday morning they confessed that their intention had been to destroy their keepers and escape. Kindness had conquered them, and they wept like children. They had been, and continued to be, among the best men in the prison. He had found it important to separate the old from the young. Ninety per cent. of the prisoners were better men on their release than they had been on their commitment. That was his experience. Kindness gave power. Hope should be held out to prisoners.

Mr. Bigham, of Pennsylvania, said that under the leadership of the great founder, William Penn, his State had been a pioneer in prison discipline, and she intended to maintain her pre-eminence.

General Eggleston, of Mississippi, said that he was from the South, and wished to say a few words respecting that section of the country. He claimed that his State was in advance of some of the older States. She had forbidden the use of the lash in punishing prisoners. They had adopted the commutation system, shortening the term of imprisonment for good conduct three days each month. They had religious service, Sunday-school, a fine melodeon played by a convict, and excellent singers among the prisoners. They found music a power in moral training. On Christmas they gave the convicts an extra dinner, and full freedom within the prison premises to converse and amuse themselves as they pleased. They found no harm, but rather benefit, to be the result of this indulgence. On his release they took from the pris-

oner every mark of his convict service, gave him a complete outfit of clothing, and ten dollars in money.

A report from New Hampshire, by the Rev. Dr. Clark, was read. (See page 426.)

A report from South Carolina, prepared by General C. J. Stolbrand, was read by Judge Walker. (See page 447.)

The Rev. Mr. Woodbury, of Rhode Island, read a report from that State. (See page 440.)

Dr. Wines, of New York, read a paper contributed by Sir Walter Crofton, of England, on sundry points discussed at the Congress of London, with a view of correcting certain errors into which he considered members of that body had fallen regarding the state of things in his country. (See page 359.)

Dr. Wines said that it gave him pain to differ from a gentleman whom he so much respected, admired, and loved, both on account of his personal qualities and his great services to the cause of prison reform as he did with the author of that paper. Still, he could not accept his views on penal labor as an instrument of reformation, or the lash as a disciplinary punishment in prisons. These were the only points, he believed; certainly they were the principal ones, on which he dissented from the opinions of his distinguished friend, to whom the world is so much indebted for his labors in the cause of prison reform.

Mr. Powell, of New York, read a paper on "Intemperance and Crime." (See page 364.)

Mr. Pierce, of Massachusetts, said that the paper just read treated intemperance as the chief cause of criminality. But mere statistics would not show what produced crime. Intemperance was often an incident of low life. He referred to the separate system, the Crofton system, and the Maconochie system of prison discipline, and condemned them all as "weighed in the balance and found wanting." He did not come there to boast of his own State; there were things there that ought to be different; but the worst thing they had to contend with was the indifference of the people on this question of prison reform. The administration of county prisons in Massachusetts was very objectionable; you could not work into them any regular system.

Mr. Coates, of Pennsylvania, admitted that intemperance was not the only cause of crime, but it was one of the greatest, in his view the very greatest, of these causes, and should be distinctly so set forth. In this matter, he that was not with us was against us. Let no man tell him that they had not the power to crush this giant enemy to the order and welfare of society. They had the power if they would but use it. He appealed, in conclusion, to the members of the congress, as men and as Christians, to aid in the suppression of this great evil.

Mr. Vaux, of Pennsylvania, said that he fully indorsed the views of the gentleman from Massachusetts (Mr. Pierce) on this subject. He did not believe that intemperance was *the great cause* of crime; there were others greater. He objected to sweeping accusations. The worst murder in New York, that of the policy-dealer, was not caused by intemperance; and so in the Stokes case. He hoped temperance would succeed, and he would do what he could to help its success; but, said he, let us be wise, and not by the mere use of terms, by dreams, increase the catalogue of crimes.

Mr. Folger, of New Hampshire, said that the rule laid down by the Savior was, "by their fruits ye shall know them." It was by that rule that intemperance should be judged in its relation to crime. He was glad the question had been brought before us. He was sorry it had been ignored at London. Despite the silence maintained there, the

governor of an English prison had informed him that drink brought most of his prisoners there. As to what had been stigmatized as *police espionage*, we might judge that by its fruits also. It had been tried and worked well in England. So it might be in this country. There it was a kind care, and not an *espionage* at all.

Dr. Parish, of Pennsylvania, had desired to hear the paper on intemperance, but had not been in at the reading. He concurred in the views of Mr. Vaux. He once asked the chaplain of the Eastern penitentiary how many inebriates they had there. He replied, "not one; inebriates are not the kind of persons who become convicts." He protested against the use of sweeping declarations—against ultraism. Drunkenness was not, *per se*, a crime.

Mr. Powell, of New York, replying to Dr. Parish, said that he had visited the Eastern penitentiary, and was informed by the warden that nine-tenths of the inmates had been addicted to the use of intoxicating liquors. As to the murderer, Foster, it was in evidence that he had spent the evening in drinking, and Stokes was of the same character; he had been assured that he was under the influence of liquor when he committed the act. The paper he had read did not undertake to fix the status of drunkenness; the laws and the courts had done that.

The Rev. Mr. Woodbury, of Rhode Island, said that we were very apt to consider things that seemed to be connected as cause and effect. We might possibly err in this. None of us would consider drunkenness as a crime of *itself*; but we all agreed that intemperance and intoxication were indicative of a want of self-control, in which state all crimes became possible; and a lack or neglect of possible self-control was sin. The appetite for drink was sometimes inherited; and the desire for gratification came upon its subjects periodically, say, every six or twelve months, and was then uncontrollable. He once roomed in a theological school with a young gentleman whose appetite came upon him so strongly that he shut himself up for several days and secretly indulged in drink. And then, after an interval of soberness, he would have another surrender of himself to drink. The *habit* of intemperance was formed by indulgence, not inherited, or caused by disease. This habit was indicative of a want of self-command, a lack of full manhood, that we should endeavor to develop and strengthen. Persons without this self-command were often shown by facts and confession to have been suddenly assailed with temptation, without any previous intention, to commit crime. Convicts very frequently stated that they had no thought of doing the wrong until they became intoxicated.

Recess until 7 o'clock p. m.

EVENING SESSION.

The congress re-assembled at the appointed hour, Governor Seymour in the chair.

Mr. Develin, of New York, read a paper on the susceptibility of criminals to reformatory influences, communicated by Dr. Anderson, president of the New York Catholic Protectory, who was unable to be present himself. (For Dr. Anderson's paper see page 359.)

Dr. Wines said that it would be impossible for him to present his annual report in full, unless the congress was prepared to devote a day to hearing it read. As this evening was to be given up to a consideration of reformatory work, he would read what his report contained on the reformatory system of Great Britain. (See Part I of his report, pp. 116-122.)

Dr. Wines read a communication from Mr. Demetz, founder and director of the penitentiary colony of Mettray, France, on the preparatory school, connected with the colony, for the training of sub-officers to be employed in the institution. (For the letter of Mr. Demetz, see page 358.)

The Rev. Mr. Woodbury, of Rhode Island, read an exceedingly interesting paper on preventive and reformatory work in Massachusetts, prepared by Mr. F. B. Sanborn, a member of the board of public charities in that State. (For Mr. Sanborn's paper see page 400.)

Mr. Develin then addressed the congress in regard to the Catholic Protectory of New York City. He said that the institution was founded and commenced operations in 1863. It had since aided 7,000 children. The present number of inmates was 1,250, 360 of whom were girls. It was in no sense a prison, with bars and massive walls to encompass the children, but an institution where the children were made to feel that the managers and officers were their true friends, and where the rule was maintained almost wholly by moral forces. The boys all learned trades, becoming typesetters, stereotypers, machinists, shoe-makers, tailors, carpenters, chair-makers, bakers, farmers, and gardeners. An account was kept with each boy and girl in the institution. The officers were careful to inculcate the idea that labor is a duty, and that it is ennobling, not degrading. They allowed inmates so much per month or week, according to their diligence. One boy had earned enough to bring his mother, three brothers, and a sister from Ireland to this country. Another had saved and invested \$300 in land near the school, and the indications were that by the time the lad had reached his majority, his investment would yield him sufficient capital to enable him to start in business. Many other boys in the school had accumulated larger or smaller sums of money by their industry. In the shoe-making business, the institution was a small Lynn. The boys did jobs of printing for people outside, and the same with other trades carried on in the protectory. They had pigeon-holes, into which were put checks or tokens of good conduct; and the scholars, according to the number of these tokens, received small gifts; to the younger children were given toys; to the older, money. They allowed the well-behaved to roam in the adjoining woods, to bathe in the river, to row in boats, and to fish. In this way they endeavored to show the boys that they were their friends. They endeavored to bend the twig aright, so that when the boy became a man, he would prove a good and useful citizen. The boys felt that their institution was a home. The protectory was a Roman Catholic institution, but it received Protestant boys and girls, and no restriction was placed upon their attending Protestant churches and Sunday schools, nor were any attempts made to induce them to embrace the Catholic faith.

Mr. Develin said that there were more causes than one for congratulation on the meeting of this congress, but a principal cause was the common ground on which we could all stand, compare views, and work in harmony. It had been so in the Cincinnati and London congresses, and it was so in this. Dr. Wines, an eminent American Protestant, and Dr. Manning, an eminent Catholic prelate of England, united in the one great and noble work of assisting the prisoner in his efforts to reform. We had hoped for the presence of the Catholic archbishop of this city, who had been invited to open one of the sessions of this congress with prayer; but he had been prevented by sickness, which had caused him to seek a healthier clime.

Mr. Develin closed by inviting the members of the congress to visit

the protectory. If they would come to the office, No. 29 Reade street, they would be conveyed to the institution by carriages.

Mr. Pritchard, of Kentucky, in consideration of his being obliged to leave the city to-night, asked that the discussion on reformatory institutions might be suspended at this point to enable him to introduce, and the congress to pass, a resolution condemning the system of leasing prisons to contractors. It was a question in which he felt a very deep interest, and he would be glad to be present when it was discussed. It was explained by the president that when the subject came up for consideration to-morrow, the colleagues of Mr. Pritchard would be present, and would, no doubt, represent the public opinion of Kentucky on this subject. After further conversation, Mr. Pritchard withdrew his request, and the discussion on reformatories was resumed.

Mr. Talcott, of Rhode Island, said that he was from a small State, and was at the head of one of the smallest institutions for reform in the country. The work was a great one, and how to do it wisely and well was the question. To learn this he had come here; and while willing to give his own views, he hoped to hear from others who had had greater experience. He had two hundred children and youths in his institution, and thirty more placed in families in different parts of the State, whose names were on the roll. They were boarded out at \$2 a week, and must be reported upon at least monthly. From one to two dollars a week were paid for their education. If the children staid three or four months in a family, arrangements were made for continuing them there. The discipline of the institution was parental, as much so as they knew how to make it. Some correction was occasionally necessary, and a little chastisement, administered in a right spirit, had a good effect. The special feature of the institution was that of a family-home.

The Rev. Father Quinn, of New York, asked: "Do you have walls surrounding your reformatory?"

Mr. Talcott replied that they had.

Father Quinn. "Is there any special feature in your institution wherein it differs from other reformatories?"

Mr. Talcott. "No, it is very much like other institutions, having the same end in view."

Rev. Mr. Sheldon, of New Jersey, superintendent of the reform school for boys at Jamesburgh, said that their plan embodied the family system as far as possible. Boys were sent to them up to twenty-one years of age. They had power to release any inmate at the end of a year, if they judged it expedient. They sought to infuse the stimulus of hope into the minds of the boys. They had no encircling wall. They sought to get into the heart of the boy; they sympathized with him in his troubles, and so endeavored to hold him by the power of kindness. For the encouragement of fellow-laborers in this work, he would say that kindness had wrought wonders for them. It was the great power with which to mold these young hearts to virtue. It won their confidence and restored their self-respect, both of which were great elements in effecting their reformation.

Mr. Shipley, of Ohio, thought that prevention was the great thing. He believed in compulsory education as an effective means to this end. There were parents who would not educate their children, but would sooner train them for crime and ruin. They had a law in Ohio by which they could take a child away from such parents, to the benefit of society and the salvation of the child.

Judge Walker, of Michigan, asked: "How long have you had this law, and what have been its results?"

Mr. Shipley answered: "We have had the law four years, and it has worked well; many children have been rescued and placed in good homes with farmers."

Judge WALKER: "Can children be taken away from parents without their consent?"

Mr. SHIPLEY: "Yes. Our institution is 'the house of refuge' for those worse than orphan children."

Mr. Milligan, of Western Pennsylvania, said that they had adopted in their prison almost all the reformatory measures that had been advocated in this congress, and they looked forward to a bright future of successful reformatory work. But he would like to hear discussed in this congress the criminal codes of the several States and their administration. He believed that there was more crime produced by defective laws and bad administration than was prevented or punished by them. Criminal laws and courts seemed to him a mighty machine for the manufacture of criminals. He favored indefinite sentences and graded prisons. Would they turn a person infected with the small-pox loose to spread the contagion? That seemed to him quite as reasonable as it would be to release a prisoner infected with the leprosy of crime, which was worse than that of small-pox.

Mr. Ames, of Massachusetts, desired to emphasize the views expressed by Mr. Shipley in favor of preventive measures. They had a law in Massachusetts like that of Ohio, by which children exposed to want and in danger of falling into crime could be taken from their parents, and thus preserved from matured criminality. That was prevention, which was better than cure. The lovers of humanity should awake and put forth every effort to save the crowds rushing to ruin, young women especially. Seventy-five per cent. of those rescued by this law from the criminal example and teaching of their parents, and from association with the vile, were saved. They should retain a supervision over such during their minority, kindly watching over them, getting them into good family-homes, and thus preparing them for the highest position that woman could occupy—that of wife and mother. He might be an enthusiast, but he believed that hundreds and thousands of girls, now just commencing a course of crime and infamy, might be saved. A far greater number of institutions than now existed should be established in every State, both preventive and reformatory.

Mr. Rockwood, of Utah, said that in 1853 an act was passed in that Territory, authorizing the probate judge to take any child, on presentation of proper evidence that it needed care, and bind it out, at the discretion of the court. He had known children who had been thus saved as brands from the burning. They could also bind out juvenile offenders that were found drunk on the streets; if claimed by responsible persons, they were surrendered; but if there were no such to care for them, they bound them out.

Dr. Wright, of Tennessee, read a report on the penitentiary system of his State. (For his report see p. 449.)

No report having been sent in from Missouri, General Miner and Mr. Miller submitted a report prepared during the sessions of the congress, which, without being read, was placed on file. (For this report see p. 424.)

General Miner, on behalf of the Missouri delegation, invited the congress to hold its next meeting in Saint Louis, and assured them of a hearty welcome.

Adjourned till 10 to-morrow morning.

FOURTH DAY—MORNING SESSION.

FRIDAY, *January 24, 1873.*

The congress re-assembled at 10 a. m., pursuant to adjournment.

In the absence of the president, Judge Walker, of Michigan, one of the vice-presidents, on invitation, took the chair.

The Rev. J. L. Milligan, of Pennsylvania, opened the session with prayer.

Mr. Miller, of Missouri, renewed the invitation to the congress to hold its next meeting in Saint Louis, repeating the assurance of cordial welcome by the city and the State, and adding, "You need to see our people and our city; and we need to see and hear you, to receive the lessons you will give us, and to feel the quickening of your presence."

On motion, the invitation was accepted, with thanks. Subsequently in the day, a telegram was read from the Hon. Joseph Brown, mayor of Saint Louis, repeating the invitation, and promising the congress the heartiest of Missouri welcomes, which was received with much applause.

Dr. Wines stated that the board of directors of the National Prison Association, at a meeting held in this city yesterday, had resolved to have these annual congresses in the spring, during the month of May or June, the exact date to be fixed according to circumstances, by the board, or its executive committee, and that the next meeting would, as a matter of course, take place in the spring of 1874.

Dr. Wines further stated that the constitution of the national association provided that committees of correspondence should be formed in all the States at the earliest practicable moment, to co-operate with the association in pushing the work of prison reform in all its departments, but especially in the gathering of criminal, penitentiary, and reformatory statistics, and that he had been instructed by the board of directors to invite the delegations from the several States to hand in to him the names of such persons as they judged competent and suitable to be placed upon the proposed committees. He further said that it was the judgment of the board that where boards of State charities or prison associations exist, instead of forming new organizations they should be invited to co-operate with the national association in the manner and for the purpose indicated.

On motion, it was ordered that the further reading of reports from States be dispensed with, and that reports not hitherto read be referred to the executive committee of the association for publication, either in full or epitomized form, in the transactions of this congress.

Dr. Wines read a paper by Miss Carpenter, of England, on life-sentenced prisoners, at the conclusion of which he said that he much regretted that the pressure of business on this last day of the sessions of the congress was such as to forbid an extended consideration of the very important question treated by Miss Carpenter. The paper was able and suggestive, like everything that came from the pen of that distinguished philanthropist and writer. It presented many very striking views, and though there was no time at present to consider and discuss them, the essay would be printed as a part of the proceedings, and would be as seed cast into the public mind and thought of the country and the world. (For Miss Carpenter's paper see page 348.)

Mr. Shipley, of Ohio, chairman of the finance committee, and treasurer of the congress, reported that \$244 had been received, that all bills had been paid, and that there remained a surplus of \$73.85. On motion of Mr. Griffith, of Maryland, it was ordered that the balance in the hands of treasurer be appropriated to the National Prison Association,

and it was accordingly handed over to the secretary, for transmission to the treasurer of the association.

In the absence of Mr. Monfort and the other secretaries of the congress, General James L. Miner, of Missouri, was, by vote of the congress, invited to act as secretary in their place.

Dr. Wines, on behalf of the special committee appointed to consider the expediency of petitioning Congress to make an appropriation in aid of the work of the National Prison Association, reported the draught of a memorial addressed to that body.

General Eggleston, of Mississippi, and Mr. Vaux, of Pennsylvania, doubted the propriety of the action proposed.

Governor Seymour, of New York, said that he was what was called a "States' rights" man, and that upon that point he agreed with the gentlemen who had preceded him. But there was one aspect of this case which took it out of the scope of their criticisms. The movement in which we were engaged was national, and even international. We were in fact a part of the congress which met in London last year. We acted, therefore, in a national relation. Criminal administration and prison discipline belonged to the National Government, as well as to the governments of the States, for the United States, equally with the individual States, had its courts and its convicts. Besides, the District of Columbia and the Territories were within our purview, and these were under the immediate jurisdiction of the National Government. And then, as he had said, this work was international, as well as national. The London Congress formed a permanent international commission, charged with the duty of organizing a plan for the collection of international penitentiary statistics upon common principles, and according to common formulas; and it was expected that all nations would co-operate in this work. Would the United States Government alone stand aloof from it? He thought that the Government should not and would not decline co operation in an object at once so catholic and so important.

The discussion was continued for some time, a number of delegates taking part therein.

Governor Seymour resumed the chair, and Judge Walker moved that the report of the committee be adopted; that the president and secretary be authorized to sign the memorial; and that a committee of thirteen, of which the president should be chairman, be appointed to present the memorial to Congress.

The motion passed, and the following gentlemen were appointed on the committee: Hon. Horatio Seymour, of New York, chairman; Hon. Richard Vaux, of Pennsylvania; General J. L. Miner, of Missouri; General B. B. Eggleston, of Mississippi; Hon. C. I. Walker, of Michigan; Governor F. Smyth, of New Hampshire; Hon. Edward Earle, of Massachusetts; Hon. R. K. White, of Kentucky; Hon. Isaac D. Jones, of Maryland; Murray Shipley, Esq., of Ohio; Professor W. F. Phelps, of Minnesota; Rev. H. W. Bellows, D. D., of New York; and Dr. E. C. Wines, of New York.

Mrs. Richardson, of Missouri, through Judge Walker, offered the following resolution, which was unanimously carried, viz:

Resolved, That the friends of prison reform be earnestly invited to show their interest in the cause by becoming members of the National Prison Association, and thus promote its usefulness and at the same time aid in the circulation of the works of that great statesman, jurist, and prison reformer, Edward Livingston.

Mrs. Richardson sent up \$10 to constitute herself a member of the association, thus proving her faith by her works.

Judge Walker, of the business committee, reported six resolutions on points which had been, in some form, referred to the said committee.

For these propositions see further on, under the heading "Resolutions adopted by the congress."

The first resolution, relating to the connection between intemperance and crime, the subject having been fully discussed yesterday, was carried unanimously.

The second resolution, relating to the leasing of prisons, gave rise to an extended discussion.

General Eggleston, of Mississippi, said that the "leasing system" prevailed in his State, but worked badly. They found themselves imposed upon by the lessees. The men were overworked. There was constant friction between the State authorities and the lessees. The authorities insisted that the men should have wholesome and sufficient rations, and be suitably clad, kindly treated, and not overtasked. The lessees complained that such interference curtailed their profits, and would compel them to surrender their contract. He thought that when their new prison building was completed and they had room for all their convicts to work within the prison premises, the system would be definitely abandoned.

Dr. Wright, of Tennessee, defended the system, as practised in his State. They retained control of the discipline and management of the prison. They did not for a moment lose sight of the interests of the convicts, whose reformation they earnestly sought.

Mr. South, of Kentucky, said that he did not quite agree with the views of his colleague, Mr. Pritchard. He defended the system in part, and commended the humanity of the late lessee, Captain Todd.

Judge Walker, of Michigan, said that there seemed to be some difficulty or misunderstanding, which he thought grew out of the term "leasing." He thought the word "contracting" would be preferable. There was a prejudice against leasing, but in all the States there was something of the contract principle and practice. The term "leasing" conveyed different ideas to different minds.

Governor Seymour supposed leasing and contracting to be very much the same thing.

Dr. Wines, of New York, said that, with all deference to the two eminent gentlemen who had last addressed the congress, he conceived that there was a material difference between the leasing system and the contract system, and, although he did not like the latter, he considered the former greatly more objectionable. Under the contract system, the labor only of the convict was hired out; while the whole care of the prisoners, the discipline, the clothing, the bedding, the food, the medical attendance, the religious and secular instruction, the hours of labor, &c., were retained in the hands of the authorities. But, under the leasing system, all this was changed. The whole control and management of the prison, including the material and moral interests of the prisoners, were turned over to the lessee, who was sometimes an individual and sometimes a business company; but always a party whose sole object was to grow rich, first out of what the convicts could earn, and next out of what could be saved from the cost of feeding, clothing, and housing them. The prison was let, as he understood it, for a term of years, to the party who offered the highest bonus to the State, over and above the keep and care of the prisoners. Other considerations might possibly come in, but this was the main and controlling one. He

looked upon it as a system objectionable to the last degree. It was the same system against which John Howard, a hundred years ago, lifted up his voice and employed his pen. That was the English system of his day. He had had some opportunity of learning the state of public opinion in some of the States where the system had been tried in this country. He first met the system in Illinois in 1865, where he found public sentiment unanimous, or nearly so, against it; and a year or two later it was crushed out. He next went to Missouri, where the system had previously existed, but public opinion had destroyed it. He then passed over to Kentucky, where the system was then and is still in vogue. But even there those most closely connected with it—the prison inspectors, for example—were against it. One of them pronounced it, in his judgment, the worst system that human ingenuity could devise. He admitted, and was glad to admit, that Captain Todd, who was at that time the lessee, was a humane and just man, and he had proved his disinterestedness, as well as the breadth of his views and the elevation of his character, by advocating a policy which no doubt would have taken thousands of dollars annually out of his pocket, that is to say, the creation of a prison for juvenile offenders, which would have removed fifty to a hundred young men from his institution, and deprived him of the profit of their labor. He believed that Captain Todd had acted justly and honorably by the convicts, but the account he had received of the conduct of previous lessees—some, not all—was quite different. It was the *principle* of the plan to which he objected. It was too liable to abuse, and the temptation to abuse was too strong. In the millennium it might do, if there were any prisons then; but in the present condition of human nature, he believed the system radically and incurably vicious.

Mr. White, of Kentucky, agreed with Dr. Wines. He did not ask the congress to pass judgment upon his State, but he wanted to settle a principle of prison treatment. Indiana had once tried this system; but she found that while it enriched the contractor it robbed the people and demoralized the prisoner.

Colonel Burr, of Ohio, said that though they contracted the labor of their prisoners, they retained complete control of them. A contractor could not even *speak* to a prisoner, except to tell him what to do, and he (Colonel B.) had the power, on the least interference of a contractor, to dismiss him and forbid his return to the prison; and more than once he had exercised that power. But leasing a penitentiary, with the power of control over the convicts vested in the lessee, was a different matter. That was going back to the dark ages of prison discipline.

The Rev. Mr. Woodbury, of Rhode Island, said that public opinion controlled prison systems as it did everything else. As a congress we could only suggest reforms and then leave the States to decide for themselves.

Dr. Wines asked Mr. Woodbury whether the contractor in the Rhode Island prison did not agree to employ discharged convicts in his factory outside.

Mr. Woodbury replied that there was no stipulation of that kind in the contract; but there was an understanding to that effect and an obligation of honor for them to do so.

Colonel Burr said that this was, to a considerable extent, the case in Ohio.

Mr. Miller, of Missouri, expressed his detestation of the leasing system where the lessee had control of the prisoners. Where the State had control it was better; but he would prefer to have the State work

the men. It might do so through a competent agent as well as a contractor could. Mere money-making should not be a consideration. It was wrong to put prisoners into the hands of men whose sole aim was to enrich themselves out of their toil. It was the worst kind of slavery.

Mr. Woodbury said that a practical difficulty would be the capital. Where should that be obtained?

Mr. Griffith, of Maryland, without at all favoring the system of leasing, claimed that that of letting the labor on contract worked well in the Maryland penitentiary. The board had entire control.

The resolution was then adopted.

Judge Walker read the third resolution, relating to accused but untried prisoners; and the fourth relating to the aiding of discharged convicts, which were considered together.

The Rev. Mr. Doll, of Maryland, agent of the Prisoners' Aid Society, said that his society did something in the way of looking after the arrested, as well as in aid of those released from prison. Their association was but three years old, yet 581 prisoners had been discharged by the courts through his intervention. The facts collected by his investigations had convinced the judges either that they were innocent or that the charges against them were too trivial for grave, judicial proceedings. Eleven hundred and sixty-five had been aided with money; three hundred and forty-nine had had steady places provided for them, and two hundred and eighty-eight had been furnished with temporary employment. His own house had been for the last twelve months turned into a refuge for discharged female prisoners, and he would soon have to ask the people of Baltimore to provide a home for such, for the number was becoming too great for his limited accommodations. God had given him a large-hearted, noble helpmate in his wife. Fifteen poor creatures were then in his house, who but a short time ago were within the walls of the penitentiary. Fourteen of them were colored girls. And these poor creatures had made his house a *banking house* for their savings. He begged pardon for his warmth in this matter. I feel (said he) that I have a greater responsibility resting upon me than when I was ordained by the bishop, in the Methodist Episcopal Church, to what would be called a higher order of the ministry. O! sir, we want a *prison* ministry. I say to my brethren in the ministry, we must come down from our pulpits and minister to them that are in prison. A poor girl rescued from the whirlpool of prostitution and received into our home until we found her a place of employment has visited us a dozen times since, bringing small presents to testify her gratitude. She has recently been restored to her father's house, in Virginia. No prisoners' aid association is complete without a prison agent connected with it. We took charge of three poor girls a short time since that but for our aid society would have speedily rushed to ruin. Now they are saved, and are in membership with the church. We are but doing the Master's work when we thus *go down* and seek to save the lost. Mr. President, I suppose that my time is very limited; but I wish to use it all in pleading especially for the poor children needing our sympathy and aid. For them I could stand and plead until the going down of the sun.

Mr. Merrefield said that prison reform in Baltimore owed much to Mrs. Doll for the success attained through the labors of her husband.

Mr. Griffith related several telling incidents connected with this work in Baltimore. He said that the most faithful porter he ever had in his store was a discharged convict.

The resolutions were carried.

Judge Walker next read the fifth resolution, relating to the necessity of vigorous effort to improve the administration of existing prison systems.

In doing so, he said that the States did not, as a general thing, pay salary enough to secure and retain good men as wardens and keepers. The very best men were needed for the duties required.

The Rev. Mr. Milligan, of Pennsylvania, thought the resolution a very wise one. The idea was not to interfere with special systems, but to stir up all to work, on their own plans, in the best and most effective manner.

Mr. Coates, of Pennsylvania, said that that was the true idea. Let each follow his own chosen and well considered way, and "by their fruits shall ye know them."

The resolution was adopted.

Recess until 7 p. m.

EVENING SESSION.

The congress re-assembled at the hour named, Mr. Vaux in the chair.

Judge Walker read a letter from Alfred H. Love, of Philadelphia, apologizing for his absence from the meeting, expressing his sympathy in its objects, and giving his views at some length on the subject of prison discipline. (For Mr. Love's paper see page 374.)

Dr. Wines submitted a similar though shorter letter from Dr. Aiken, of Wilmington, Delaware, apologizing for his absence. He had lost his wife, and the funeral took place during the meeting of the congress.

Dr. Wines also read a short letter from Rev. C. C. Foote, late chaplain of the Detroit House of Correction. (For Mr. Foote's letter see page 374.)

He further submitted a letter received sometime ago from Hon. B. F. Butler. (For said letter see p. 369.)

Governor Seymour took the chair at this point, and announced the committee of thirteen on the memorial to be presented to Congress. The names of the gentlemen constituting the committee have already been given.

Judge Walker read the sixth resolution, relating to reformatories.

Dr. Hatch, of Connecticut, said that we had the boys, and the question was, What kind of citizens shall they be? We needed good citizens, and such came from good homes. He approved of compulsory education, and hoped for its general adoption. If the children were rightly educated, we would not need either penal or reformatory institutions. He questioned the necessity of such a resolution; it was but the alphabet; we were beyond that. Let us have warm hearts to receive the children kindly. Of course we would pass the resolution; but we were already getting beyond it.

Dr. Wines reminded Dr. Hatch that if Connecticut was beyond it, Texas was not; nor Arkansas; nor Oregon; nor a half score of other States.

Mr. Bigham, of Western Pennsylvania, said that since the Cincinnati Congress they had been considering the question of changing their institution—the Western House of Refuge—and had concluded to adopt the family plan instead of the congregate, formerly in use. They were going out some miles into the country. It would take them two years, probably, to complete their new buildings, and then they meant to have the model reform school of the country.

Mr. Coates favored teaching these boys trades. Skilled workmen

were becoming scarce, and were greatly needed. The reformatories might aid in supplying this want.

Mr. Shipley, of Ohio, said that the members of the convention sometimes lost sight of the main point. It was not so much, how can we cure the convicts and have them become good men, as how can we prevent the children from becoming convicts? Compulsory education was good, but it alone would not keep boys from growing up into criminals. We must adapt our schools to the circumstances and wants of the children. There were a great many agencies. Among them he was pleased to see the feature in the New York Catholic Protectory, referred to by Mr. Develin, that of giving rewards to little boys. He admired that plan. They had established a school in Cincinnati, and they provided a warm dinner for the needy children that attended it. They took 150 children from the street, and fed, taught, and saved them. They had their private visitor, whose business it was to find and bring them to the school; and after they had interested them in learning, they transferred them, if possible, to the public schools. They tried to act on the principle of the patriarch Job: "The cause which I knew not, I searched out."

Mr. Vaux, of Pennsylvania, believed that the old Greeks used to pray that the gods would endow us with the eloquence of silence. He felt the need of that prayer. He had been appealed to, quoted, unkindly criticised, and kindly laughed at, by some of the members of that congress. He had tried to bear it all as well as he could, and kept on praying as did the Greeks. But the time had come when it became necessary for him to say a single word in defense of his views. It had been said, "there is no partisanship in what is spoken here. We are all met to devise means to advance the cause of reform." However that might be, he would say, *God bless the work*. They should lay down *general principles*, and not go too much into particular measures. Some had praised Christianity. That was right; but they had given a slap at the individual system of treating convicts.

The Pennsylvania system had been discussed, while it was not understood by five gentlemen out of the State. The phrase "*solitary confinement*" had been used and applied to it. Miss Gilbert so characterized it, and asked, "Would you hang a Christian?" Yes, he would hang *forty* "Christians," if they broke the law and were found guilty. The Pennsylvania system should be spoken of as the separate or individual system. Howard did not commence visiting British prisons until long after Pennsylvania had reformed abuses in the indiscriminate, or rather *no* system, which then prevailed. To Pennsylvania belonged the praise of moving first in this reform. The best paper read in that congress on the prison question was that of Dr. Despine, of France. Until you elevate this reform to a science, you are running after vagaries. You must study and know the criminal himself. Such knowledge was the basis of all right prison treatment. You cannot reform criminals by merely putting them into prison, nor prevent crime by putting boys into reformatories. You must find out what are the causes, and adapt your treatment to *them*. That is the problem; that strikes at the root of the matter. All else is but playing with the surface. You must look at principles, not mere details. You must look at the question as statesmen, not as politicians. Politics must be eliminated from prisons and prison management.

The president asked Mr. Vaux whether in Pennsylvania the prisoners were kept separate, or were allowed to receive visits.

Mr. Vaux said that they were separated from each other, but not from the world.

The Rev. Mr. Bradford, of Connecticut, said that the great question was how to care for the young in the reformatory, how to save them from becoming criminals. They should take care of the girls in peril of falling. Save them, and society was saved. They had in Connecticut the model school. They were ahead of Massachusetts. They had had remarkable instances of reformation, of which he gave several interesting illustrations. They had no bars and bolts more than in private houses. As regarded labor, the girls were engaged in making paper boxes, and ten per cent. of the money earned belonged to themselves. Some had saved \$75 or \$100. This was a great stimulus; it put hope into them, without which none of us could accomplish much.

The resolution was then agreed to unanimously.

On motion, the cordial thanks of the congress were tendered to the Prisoners' Aid Association of Maryland for the abundant labor expended in preparation for this meeting; to the citizens of Baltimore, for courtesies and hospitalities; to the band of the House of Refuge for the excellent music with which they entertained the congress at its opening session; to Mr. Raine for a liberal reduction on the rent of his beautiful and commodious hall; to railroad companies and proprietors of hotels for reduction of fares and board; to the reporters of the associated press and the Baltimore journals for their services in making known the doings of the congress; to the Rev. Wm. H. Tiffany, who kindly rendered his service as official reporter to the body without charge; to the Young Men's Christian Association and the managers of the numerous penal, reformatory, and charitable institutions of Baltimore and vicinity for invitations to visit and inspect the establishments under their care; and to the Hon. Michael C. Kerr, a member of the Congress of the United States from the State of Indiana, and of this body by appointment of the executive of that State, for his eloquent and instructive address, delivered on the evening of the 21st instant.

Dr. Wines moved the following:

This congress, while expressing its gratitude for the valuable reports and papers furnished by writers, at home and abroad, cannot assume responsibility for every sentiment and utterance contained in them. It holds itself responsible only for the principles and acts sanctioned by a formal vote.

Dr. Hatch rose and said: The business of this congress is concluded. I hope we shall now, for a few moments, resolve ourselves into a mutual admiration society, have a good time, and shake hands all round. I love sharp men, [looking at Mr. Vaux;] they bring out points more distinctly.

Mr. Vaux reciprocated the kindly feeling.

Dr. Hatch continued: We shall go home refreshed, prepared to work with warmer hearts and a more earnest zeal. We are satisfied that the great thing is, to have the right kind of men in charge of our prisons and reformatories. It is not the separate, or the associated, or the family system that will do the work; but good men, earnest men, men working in the right spirit. Thus acting, we shall advance in our great reform; and when we meet next year, in Saint Louis, brothers Vaux and Milligan and all being there, we will renew friendships, compare notes, exchange congratulations, and move onward with equal tread in the march of improvement.

Mr. White, of Kentucky, expressed his pleasure at seeing his own opinion so fully represented in this congress. Once the cry was, save the criminal; now the better idea is, to preserve from crime. The friends of this movement will hear of our doings, and take courage.

Mr. Talcott expressed much satisfaction with what he had seen, heard, and felt since he came to Baltimore. He believed that in this warfare upon crime we should prevail, relying for the victory on Him "to whom belong the kingdom, and the power, and the glory."

Dr. Wines said: I do not rise, Mr. President, to make a speech, but to give, in few words, an account of my stewardship. It is just twenty-seven months since the Cincinnati congress met, at which meeting it was voted, with absolute unanimity, that an international congress should be convened. Cincinnati asked me to undertake the organization of that movement. It was impossible to answer so grave a proposition on the spur of the moment. All I could then do was to promise to consider it, venturing, however, to add, that in case I concluded to accept the honor and the labor, if there did not, in 1872, assemble in London a congress composed of five hundred delegates, coming from the very ends of the earth, it should not be for the want of work put forth to accomplish that result. Well, the congress met in London last July. More than four hundred delegates were present. Every state in Europe, except Portugal, was officially represented. Our own Government, Mexico, several of the South American States, the West India Islands, Bengal, Ceylon, Australia, Japan, Hong-Kong, and most of the States of our own Union, had delegates there. It was an able body, equipped and ripe for the work in hand. And notwithstanding these four hundred and odd representative men and women came from so many and such widely distant regions, differing in nationalities, speech, institutions, usages, ideas, and manners, yet, after ten days of mutual conference and consultation, they were able to agree, unanimously, upon a declaration of principles of prison discipline, which was substantially an echo of the declaration made at Cincinnati. Surely, "the Divinity that shapes our ends" never stood more conspicuously revealed than in such an issue under such circumstances. I have been permitted to see all this, and to return to commit the result of the work which you gave into my hands to your judgment and kindness.

Colonel BURR, of Ohio. The congress can only say, "Well done, good and faithful servant."

Judge Walker moved a special vote of thanks to the Hon. Horatio Seymour for the ability, dignity, and courtesy with which he has performed the duties of the chair; and to Dr. Wines for his faithful, devoted, and successful services in the cause of prison reform.

In making this motion, Mr. Walker said: Ladies and gentlemen, we have all been charmed by the dignity, urbanity, and wisdom of our president in his official relations to this body, and with the clearness, power, and eloquence of his utterances, whenever he has favored the congress by taking part in its discussions. As to the corresponding secretary, we are so much indebted to his labors that language utterly fails in attempting to express our obligations to him. Except for his labors, the Cincinnati congress would not have assembled; nor the international congress have been held in London; nor the present congress have convened in Baltimore; nor the work of prison reform have gained such an impetus in this and other countries. If any man living, he surely may be congratulated on having accomplished something for the amelioration of his race.

A few words in relation to this gathering: I came here not as an expert; I had had a little experience, and had given some attention to the subject. But I came to learn, not to teach. I have enjoyed this congress; have felt it to be good to be here, among men so unselfish. It does us all good to meet with such men. I have known something of Baltimore,

but I was not prepared to see its advanced condition in relation to the great works of Christian charity. Brother Doll, to-day, indicated something very promising. God speed you in this great work for truth and humanity. Another thing: we have no *Friends* in my neighborhood in Michigan. But I have Quaker blood in my veins, and have attended many a silent meeting. I am glad to see some of the "Friends" here, aiding the good cause, in the spirit of the great Master.

He called for the vote on the resolution of thanks to the president and corresponding secretary.

Carried by acclamation.

Mr. Merrefield thanked Mr. Walker for his kindly greetings to his Quaker "Friends," and heartily reciprocated them in their name as well as his own.

Dr. Wines bowed his thanks, simply remarking that this more than paid for all the service he had rendered.

Governor Seymour said: I am deeply grateful for this kind expression of your feeling. My claims to your gratitude are light indeed compared to those of Dr. Wines. There have been features connected with this convention very peculiar. Generally men meet to carry out their special views. We met as strangers, with all shades of sentiment. Yet, with abundant sources of difference, we have gone through our deliberations in harmony. We have received the ideas of others with respect; we have advanced our own without arrogance or dogmatism. I think we may say that there is something in the very cause we are engaged in which has produced this concord and consideration for each other. We may not have accomplished all we desired and hoped for the good of those within prison walls; but we part with kinder feelings than those with which we came together. It is sad to think that many of us have met for the last time. It is my wish and hope that we may all go to our homes in safety; and that we may be successful in doing something to advance virtue, wisdom, reform, and happiness in society.

The president then declared this congress dissolved, and announced that another congress, similar in character, would convene in the city of Saint Louis in the spring of 1874.

VI.—RESOLUTIONS ADOPTED BY THE CONGRESS.

As the National Congress of Cincinnati, in 1870, adopted a comprehensive declaration of principles of prison discipline, and the International Congress of London, in 1872, re-affirmed, substantially, though in a condensed form, the same platform, it was judged by the Congress of Baltimore unnecessary to formally go over the ground again in 1873. Nevertheless, in the course of the proceedings, several members introduced resolutions relating to special points connected with penitentiary or reformatory work. These were referred, as introduced, to the business committee, which, on the last day of the session, reported them back, in a form more or less modified, for the action of the congress. The greater part of the last day's session was devoted to a consideration of the questions raised by the resolutions, which, after having been variously amended, were adopted, and are as follows:

I. *Whereas*, it is fully established by incontestable facts that intemperance in the use of intoxicating liquors is one of the principal incitements to crime, as well as a chief cause of pauperism; and *whereas*, it

follows that in proportion as intemperance is suppressed, crime and its terrible consequences will be prevented: Therefore,

Resolved, That this congress will welcome and encourage any wise and efficient measures for the suppression of this great evil, whether by an appeal to moral and religious principle, by voluntary effort, by legislative action, or by the enforcement of existing laws.

II. *Resolved*, That the best interests of prison discipline demand that the governments controlling prisons, whether state or municipal, should, through their officers, have the entire control of the prisoners, both as to their hours of work and their treatment; and that any system of leasing or of contract that does not secure this, can but be injurious to the best interests of both the prisoners and the public.

III. *Resolved*, That prisoners' aid societies and other like associations to befriend discharged prisoners and to assist them in procuring homes and employment, have proved most effective as an auxiliary in the reformatory work, and that the organization of such societies, where they do not exist, is most cordially recommended, and urged as a duty upon the friends of prison reform.

IV. *Resolved*, That the great success which has attended the effort wherever made, and especially in Philadelphia, as shown by the paper of Mr. Mullen, for the protection of persons charged with a violation of law, by a careful investigation in each case before trial by a disinterested agent appointed for that purpose, fully authorizes this congress to recommend the establishment of such an agency in each State, and especially in each large city, where, from the great number of such charges and the haste with which many of them are disposed of, there is danger that innocent persons may often be convicted of offenses wrongfully charged upon them.

V. *Whereas*, in the present state of prison reform it is impossible to determine, either with precision or unanimity, upon an ideal system of prison discipline; and *whereas*, if that were possible, radical changes in existing institutions and their mode of administration would require much time and great effort in their accomplishment: Therefore,

Resolved, That it becomes a matter of vital importance that the friends of prison reform should make prompt, vigorous, and steadily persistent efforts for the improvement of prisons as they actually exist and are administered, and especially that they should seek to educate the public mind as to the importance of elevating the character of the service engaged in their administration, and the great necessity of securing for each service men of the highest moral and intellectual character, by providing a liberal compensation therefor, and by making the employment entirely independent of partisan influence, and also that they should, by every wise and practicable effort, seek to show both the importance and the possibility of making our prisons thoroughly reformatory in their character.

VI. *Resolved*, That experience has demonstrated that juvenile reformatories, houses of refuge and protection, and industrial schools for the training of neglected, vagrant, erring, and viciously inclined youths are among the most effective means yet devised for the saving of such youths from a life of crime; and that it is essential to the highest success of such institutions that they should not, either in theory or in fact, be or be considered as penal in their character, but rather as temporary homes for their inmates, whose treatment should approximate as nearly as possible to the parental system.

VII.—THE NATIONAL PRISON ASSOCIATION OF THE UNITED STATES OF AMERICA.

1.—OFFICERS OF THE ASSOCIATION FOR 1873.

President.—Hon. Horatio Seymour, Utica, New York.

Vice-Presidents.—Hon. James G. Blaine, Speaker United States House of Representatives, Augusta, Maine; Hon. Daniel Haines, Hamburg, New Jersey; Henry W. Bellows, D. D., 232 East Fifteenth street, New York; General Amos Pilsbury, Superintendent Albany Penitentiary, Albany, New York; Hon. Conrad Baker, Indianapolis, Indiana.

Treasurer.—Salem H. Wales, 520 Fifth avenue, New York.

Corresponding Secretary.—E. C. Wines, D. D., LL.D.; office 320 Broadway; residence, Irvington, New York.

Recording Secretary.—Bradford K. Peirce, D. D., Editor Zion's Herald, Boston, Massachusetts.

2.—BOARD OF DIRECTORS.

Samuel Allinson, Yardville, New Jersey.

William H. Aspinwall, 33 University Place, New York.

Hon. Conrad Baker, Indianapolis, Indiana.

Henry W. Bellows, D. D., 232 East Fifteenth street, New York.

Hon. James G. Blaine, Speaker United States House of Representatives, Augusta, Maine.

Rev. Charles L. Brace, secretary Children's Aid Society, 19 East Fourth street, New York.

Z. R. Brockway, Superintendent Detroit House of Correction, Detroit, Michigan.

James Brown, esq., 38 East Thirty-seventh street, New York.

Charles F. Coffin, president board of directors, House of Refuge, Richmond, Indiana.

Hon. John E. Develin, New York.

Hon. Theodore W. Dwight, LL. D., President Columbia College Law School, 37 Lafayette Place, New York.

G. S. Griffith, Baltimore, Maryland.

Hon. Daniel Haines, Hamburg, New Jersey.

E. W. Hatch, M. D., Superintendent State Reform School, West Meriden, Connecticut.

Hon. R. B. Hays, Cincinnati, Ohio.

Morris K. Jesup, 59 Liberty street, New York.

John Taylor Johnston, 119 Liberty street, New York.

A. J. Ourt, M. D., corresponding secretary board of public charities, 737 Walnut street, Philadelphia, Pennsylvania.

B. K. Peirce, D. D., Editor Zion's Herald, Boston, Massachusetts.

General Amos Pilsbury, Superintendent Albany Penitentiary, Albany, New York.

F. B. Sanborn, Editor, Concord, Massachusetts.

Hon. Horatio Seymour, Utica, New York.

Hon. L. Stanford, Sacramento, California.

Oliver S. Strong, president board of managers New York House of Refuge, 61 Bible House, New York.

Salem H. Wales, 520 Fifth avenue.

Hon. and Rev. G. William Welker, Goldsborough, North Carolina.

A. R. Wetmore, president board of managers New York Juvenile Asylum, 365 Greenwich street, New York.

Hon. R. K. White, Louisville, Kentucky.

John E. Williams, President Metropolitan National Bank, 108 Broadway, New York.

E. C. Wines, D. D., LL. D., 320 Broadway, New York.

3.—STANDING COMMITTEES.

1. *Executive committee*.—The president, H. Seymour; treasurer, S. H. Wales, and secretary, E. C. Wines, *ex officio*; H. W. Bellows, Rev. Charles L. Brace, John E. Develin, and James Brown.

2. *Committee on criminal-law reform*.—H. Seymour, Daniel Haines, Conrad Baker, James G. Blaine, Theodore W. Dwight, R. B. Hayes.

3. *Committee on prison discipline*.—F. B. Sanborn, Z. R. Brockway, Amos Pilsbury, A. J. Ourt, G. William Welker.

4. *Committee on juvenile delinquency*.—B. K. Peirce, C. L. Brace, O. S. Strong, E. W. Hatch, A. R. Wetmore.

5. *Committee on discharged prisoners*.—Daniel Haines, Samuel Allinson, Charles Coffin, R. K. White, G. S. Griffith.

4.—CORRESPONDING MEMBERS.

Miss Mary Carpenter, Red Lodge Reformatory, Bristol, England.

Miss Florence Nightingale, South street, London, England.

Right Hon. Sir Walter Crofton, C. B., Hillingdon, Uxbridge, England.

Frederic Hill, esq., 27 Thurlow Road, Hampstead, London, England.

Edwin Hill, esq., No. 1 Saint Mark's Square, Regent's Park, London, England.

Miss Florence Hill, Bristol, England.

Miss Joanna Margaret Hill, Birmingham, England.

Alfred Aspland, esq., Dukenfield, Ashton-under-Lyne, England.

William Tallack, esq., No. 5 Bishopsgate street, Without, London, England.

Charles Ford, esq., 24 New street, Spring Gardens, London, England.

Rev. Sydney Turner, inspector of reformatories, 15 Parliament street, London, England.

W. L. Sargant, esq., Birmingham, England.

Edwin Chadwick, esq., C. B. Mortlake, England.

A. Angus Croll, esq., Granard Park, Putney, England.

Miss Frances Power Cobbe, 26 Hereford Square, London, England.

George W. Hastings, esq., 1 Adam street, Adelphi, London, England.

T. B. Ll. Baker, Hardwicke Court, Gloucester, England.

T. L. Murray Browne, esq., No. 4 Old Square, Lincoln's Inn, London, England.

Edwin Pears, esq., Secretary of British Social Science Association, No. 1 Adam street, Adelphi, London, England.

Major E. F. DuCane, surveyor-general of prisons, No. 44 Parliament street, London, England.

John Lentaigne, esq., inspector of county and borough jails, Dublin, Ireland.

Captain J. Barlow, director of convict prisons, Dublin, Ireland.

M. Bonneville de Marsangy, 7 rue Penthievre, Paris, France.

M. Victor Bournat, 20 rue Jacob, Paris, France.

M. Robin, (pasteur,) 21 rue Piat, Belleville, Paris, France.

M. J. Jaillant, director of prisoners, ministry of the interior, Paris, France.

M. Jules de Lamarque, chief of bureau, direction of prisons, Paris, France.

Dr. Prosper Despine, 12 rue du Loisir, Marseilles, France.

M. Charles Lucas, member of the Institute, Paris, France.

M. le Vicompt d'Haussonville, member of the national assembly, rue St. Dominique, Paris, France.

M. Auguste Demetz, 92 rue de la Victoire, Paris, France.

M. Berden, administrator of prisons, Brussels, Belgium.

M. J. Stevens, inspector-general of prisons, Brussels, Belgium.

M. Auguste Visschers, 106 rue Royale, Brussels, Belgium.

Mr. Alstorpius Grevelink, the Hague, Netherlands.

Rev. Dr. Laurillard, secretary of the Netherlands Prison Society, Amsterdam, Netherlands.

Mr. B. J. Ploos Von Amstel, Amsterdam, Netherlands.

Dr. Guillaume, director of the penitentiary, Neuchâtel, Switzerland.

Mr. Max Wirth, chief of the statistical bureau, Berne, Switzerland.

Signor F. Cardon, director-general of prisons, Rome, Italy.

Signor Mar. Bettrani-Scalia, inspector-general of prisons, Rome, Italy.

Baron Franz von Holtzendorff, professor of law in the University of Berlin, Berlin, Prussia.

Rev. Dr. Wichern, director of the Rauhe Haus, Horn, near Hamburg, Germany.

Mr. Fr. Bruun, director of prisons, Copenhagen, Denmark.

Senhor André Fleury, secretary of the committee of inspection of the house of correction, Rio de Janeiro, Brazil.

5.—LIFE DIRECTORS BY THE CONTRIBUTION OF TWO HUNDRED DOLLARS OR UPWARD, AT ONE TIME, TO THE FUNDS OF THE ASSOCIATION.

Timothy M. Allyn, Hartford, Connecticut.

James Brown, New York.

Morris K. Jesup, New York.

W. Soldatenkoff, St. Petersburg, Russia.

E. C. Wines, New York.

6.—LIFE MEMBERS BY THE CONTRIBUTION OF ONE HUNDRED DOLLARS OR UPWARD AT ONE TIME.

Horatio Seymour, Utica, New York.

William H. Aspinwall, New York.

W. Amory, Boston, Massachusetts.

H. K. Corning, New York.

D. Denny, Boston, Massachusetts.

Edward Earle, Worcester, Massachusetts.

George B. Emerson, Boston, Massachusetts.

Mrs. Mary A. Holden, Providence, Rhode Island.

Joseph Howland, Matteawan, New York.

John Taylor Johnston, New York.

Amos Pilsbury, Albany, New York.

Jonathan Sturges, New York.

N. Thayer, Boston, Massachusetts.

C. H. Shipman, Brooklyn, New York.

B. G. Clarke, New York.

Miss M. W. Wills, Hartford, Connecticut.

7.—TREASURER'S REPORT FOR TWO YEARS.

The National Prison Association in account with S. H. Wales, treasurer

CR.

April 30, 1873. By amount of donations from May, 1871, to May, 1873.....	\$7,068 85
amount of appropriation by United States Congress....	5,000 00
loan	4,925 00
	16,993 85

DR.

April 30, 1873. To cash paid for expenses connected with the International Penitentiary Congress and for salaries.....	\$15,000 00
office expenses, including rent, fuel, light, attendance, &c.	808 00
cash paid for printing and expenses connected with two annual reports.....	594 26
cash paid for stationery.....	64 04
cash paid for postage, telegraphing, and expressage....	264 43
cash paid for office-furniture	141 97
cash paid for traveling expenses	105 25
cash paid miscellaneous expenses	14 80
balance to new account.....	85
	16,993 85

E. E.

8.—CONTRIBUTIONS TO THE NATIONAL PRISON ASSOCIATION FROM MAY, 1871, TO MAY, 1873.

California.

Mrs. L. Hutchison, Bishop Creek	\$10
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Connecticut.

Timothy M. Allyn, Hartford	\$500
James E. English, New Haven	25
R. S. Fellowes, New Haven	20
Rev. Thos. K. Fessenden, Farmington	20
Miss M. W. Wells, Hartford.....	125
Rev. Geo. Wooding, Wethersfield	10
	700

Illinois.

George W. Perkins, Pontiac.....	10
Charles E. Felton, Chicago.....	10
	20

Indiana.

Charles F. Coffin, Richmond.....	20
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Iowa.

James McCartey, Salem.....	10
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Kentucky.

Cyrus Mendenhall, Covington.....	10
P. Caldwell, Louisville.....	10
	20

Maryland.

W. R. Lincoln, Baltimore	10
G. S. Griffith	10
	20

Massachusetts.

W. Amory, Boston.....	100
William J. Bowditch, Boston	10
Gridley J. F. Bryant, Boston..	20
John W. Candler, Boston	50
Cash, Boston	10
D. Denny, Boston	100
Mrs. Henry F. Durant, Boston.....	50

Edward Earle, Worcester	\$100	
Geo. B. Emerson, Boston	100	
Charles O. Foster, Boston	25	
A. Hardy, Boston	25	
S. G. Howe, Boston	10	
Mrs. Julia Ward Howe, Boston	10	
Samuel Johnson, Boston	10	
H. P. Kidder, Boston	50	
O. W. Peabody, Boston	50	
Avery Plumer, Boston	10	
M. S. Scudder, Boston	20	
E. S. Tobey, Boston	50	
Nathaniel Thayer, Boston	100	
J. C. Tyler, Boston	10	
Samuel D. Warren, Boston	50	
Mrs. Elizabeth Farnsworth, Groton	10	
	—	\$970

Michigan.

O. Goldsmith, Detroit	10	
H. V. N. Lothrop, Detroit	10	
R. McLelland, Detroit	10	
James McMillen, Detroit	10	
John S. Newberry, Detroit	10	
C. I. Walker, Detroit	20	
Rev. Charles Johnson, Lansing	10	
	—	80

Minnesota.

F. W. Phelps, Winona	10	
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Missouri.

Mrs. A. W. Richardson	10	
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Nebraska.

H. C. Campbell, Lincoln	10	
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New Hampshire.

Rev. William Clark, D. D., Andover	10	
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New Jersey.

D. Haines	10	
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New York.

Brother Teliow	10	
William H. Aspinwall, New York	200	
James Brown, New York	600	
Stewart Brown, New York	150	
B. G. Clarke	175	
H. K. Corning, New York	150	
Erastus Corning, Albany	200	
Cash	10	
Winthrop S. Gilman, New York	150	
Bishop E. S. Janes, D. D.	10	
Joseph Howland, Matteawan	200	
James Hunter, New York	20	
Richard Irvin	75	
Morris K. Jesup, New York	250	
W. R. Janeway	25	
John Taylor Johnston, New York	200	
Henry T. Morgan, New York	75	
A. S. McDonald	20	
W. C. Palmer	20	
Amos Pilsbury, Albany	100	
H. F. Phinney, Cooperstown	25	
Rev. George L. Prentiss, D. D.	10	
Guy Richards, New York	65	
George Sterry	25	
Horatio Seymour, Utica	100	

Jonathan Sturges, New York	\$150	
Rev. William M. Paxton, D. D.	10	
E. C. Wines, New York	400	
Rt. Rev. Horatio Potter, D. D.	10	
John David Wolfe, New York	200	
Weston & Gray, New York	100	
Salem H. Wales, New York	150	
R. W. Weston	50	
John E. Williams, New York	50	
C. H. Shipman, Brooklyn	200	
	—	\$4,185 00
<i>Ohio.</i>		
Murray Shipley, Cincinnati	10	
G. E. Howe, Lancaster	10	
Mrs. R. A. S. Janney, Columbus	10	
R. B. Hayes, Cincinnati	10	
A. H. Monfort	10	
	—	50 00
<i>Pennsylvania.</i>		
Henry Cordier, Claremont, Allegheny County	50	
T. H. Nevin, Allegheny	10	
	—	60 00
<i>Rhode Island.</i>		
A. E. Burnside, Providence	10	
A. C. Barstow, Providence	20	
Jacob Dunnell, Pawtucket	20	
W. W. Hoppin, Providence	10	
Mrs. Mary A. Holden, Providence	100	
Robert H. Ives, Providence	60	
William J. King, Providence	40	
Mrs. Henry Lippitt, Providence	20	
Jesse Metcalf, Providence	10	
Seth Padelford, Providence	10	
Mrs. G. M. Richmond, Providence	30	
Miss Caroline Richmond, Providence	20	
A. & W. Sprague, Providence	100	
James Y. Smith & Nichol, Providence	40	
Amos D. Smith, Providence	10	
H. J. Steere, Providence	10	
James Tillinghast, Providence	20	
Royal C. Taft, Providence	20	
Rev. Augustus Woodbury, Providence	20	
	—	570 00
<i>West Virginia.</i>		
Thomas P. Shallcross, Moundsville		10 00
<i>Wisconsin.</i>		
Edwin Hurlbut, Oconomowoc		10 00
<i>United States.</i>		
Appropriation by Congress		5,000 00
Surplus after paying expenses of Baltimore Congress		73 85
<i>Russia.</i>		
W. Soldatenkoff, St. Petersburg		200 00
Total contributions for the two years		7,068 85

9.—ACT OF INCORPORATION.

*The people of the State of New York, represented in senate and assembly,
do enact as follows :*

SECTION 1. Horatio Seymour, Theodore W. Dwight, Francis Lieber, Amos Pilsbury, James Brown, William H. Aspinwall, John Taylor Johnston, John E. Williams, Theodore Roosevelt, Morris K. Jesup,

Isaac Bell, James G. Blaine, Conrad Baker, Rutherford B. Hayes, Daniel Haines, Enoch C. Wines, Oliver S. Strong, Bradford K. Peirce, Charles L. Brace, Charles F. Coffin, Howard Potter, Henry S. Terbell, Z. R. Brockway, Frank B. Sanborn, Edward W. Hatch, and their associates and successors in office, are hereby constituted a body corporate and politic, by the name of "The National Prison Association of the United States of America," whose duty it shall be to consider and recommend plans for the promotion of the objects following; that is to say—

1. The amelioration of the laws in relation to public offenses and offenders, and the modes of procedure by which such laws are enforced.

2. The improvement of the penal, correctional, and reformatory institutions throughout the country, and the government, management, and discipline thereof, including the appointment of boards of control and of other officers.

3. The care of, and providing suitable and remunerative employment for, discharged prisoners, and especially such as may or shall have given evidence of a reformation of life.

SEC. 2. The principal place of business of the said corporation shall be in city of New York; and the management and disposition of its affairs, property, and funds shall be vested in the persons named in the first section of this act, and their associates and their successors in office, who shall remain in office for such period, and be displaced and succeeded by others to be elected at the times and in the manner prescribed by the by-laws. The number of members to constitute a quorum shall be fixed by the by-laws.

SEC. 3. The said corporation shall have power to purchase or take by gift, grant, devise, or bequest, real and personal property to an amount not exceeding three hundred thousand dollars, subject to the provisions of chapter three hundred and sixty of the laws of eighteen hundred and sixty.

SEC. 4. The said corporation shall have and possess all the general powers, and be subject to all the liabilities, contained in the third title of chapter eighteen of the first part of the Revised Statutes.

SEC. 5. This act shall take effect immediately.

STATE OF NEW YORK,

Office of the Secretary of State, ss :

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

Given under my hand and seal of office at the city of Albany, this twenty-ninth day of April, in the year one thousand eight hundred and seventy-one.

DEIDRICH WILLERS,
Deputy Secretary of State.

10.—CONSTITUTION.

ARTICLE I. This Association shall be called the National Prison Association of the United States of America, and its objects shall be—

1. The amelioration of the laws in relation to public offenses and offenders, and the modes of procedure by which such laws are enforced.

2. The improvement of the penal, correctional, and reformatory institutions throughout the country, and of the government, management, and

discipline thereof, including the appointment of boards of control and of other officers.

3. The care of, and providing suitable and remunerative employment for, discharged prisoners, and especially such as may or shall have given evidence of a reformation of life.

ART. II. The officers of the association shall be a president, five vice-presidents, a corresponding secretary, a recording secretary, a treasurer, and a board of directors, not exceeding thirty in number, of which the officers above named shall be *ex officio* members.

ART. III. There shall be the following standing committees, namely: An executive committee, of which the president shall be *ex officio* chairman, the recording secretary *ex officio* secretary, and the corresponding secretary and treasurer *ex officio* members; a committee on criminal law reform; a committee on prison discipline; a committee on juvenile delinquency; and a committee on discharged prisoners.

ART. IV. The board of directors, of whom any five members shall constitute a quorum—two of said members being officers of the association—shall meet semi-annually, and in the interval of its meetings its powers shall be exercised by the executive committee, which shall fix its own time of meeting.

ART. V. Committees of correspondence shall be organized in the several States, as may be found practicable; and the formation of State associations shall be encouraged.

ART. VI. Any person contributing annually to the funds of the association not less than ten dollars shall be a member thereof; a contribution of one hundred dollars at any one time shall constitute the contributor a life member; and a contribution of two hundred dollars at any one time shall entitle the contributor to be a life director. Corresponding members may be appointed by the board of directors or by the executive committee. The power of electing officers shall be confined to the corporate members of the association.

ART. VII. The association shall hold an annual meeting at such time and place as the executive committee shall appoint, on which occasion the several standing committees, the corresponding secretary, and the treasurer shall submit annual reports. Special meetings may be called by the president in his discretion, and shall be called by him whenever he is requested to do so by any three members of the board.

ART. VIII. All officers of the association shall be elected at the annual meeting or some adjournment thereof; but vacancies occurring after the annual meeting may be filled by the board of directors, who shall also appoint all committees not chosen at the annual meeting; and all officers shall hold over till their successors are chosen.

ART. IX. The executive committee shall consist of seven members of the board of directors—the president, the recording secretary, the corresponding secretary, and the treasurer being *ex officio* members—any three of whom shall constitute a quorum for the transaction of business.

ART. X. This constitution may be amended by vote of a majority of the members of the association at any meeting thereof: *Provided*, That notice of the proposed amendment shall have been given at the next preceding meeting.

11.—BY-LAWS.

I. The order of business at each stated meeting of the board shall be as follows:

1. Reading of the minutes.
2. Report of the treasurer.
3. Report of the corresponding secretary.
4. Reports from standing committees.
5. Reports from special committees.
6. Miscellaneous business.

II. The president, corresponding secretary, recording secretary, and treasurer shall perform the customary duties of their respective offices.

III. The president shall appoint the committees, unless otherwise ordered by the association.

IV. The president shall decide questions of order, subject to an appeal; and the rules of order shall be those in Cushing's Manual, so far as they may be applicable.

V. No bills shall be paid by the treasurer unless approved and signed by the chairman of the executive committee, or by some other member of said committee designated by him.

VI. No alteration shall be made in these by-laws, except on notice of the proposed amendment given at a previous meeting of the board.

NATHAN B. ABBOTT.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

*A bill (H. R. 3041) for the relief of Nathan B. Abbott, Company H,
Twentieth Connecticut Volunteers.*

FEBRUARY 19, 1873.—Referred to the Committee on Military Affairs and ordered to be printed, to accompany H. R. 3041.

WAR DEPARTMENT, *February 18, 1873.*

The Secretary of War has the honor to report to the House of Representatives, for the information of the Committee on Military Affairs, in reply to letter of said committee of the 7th instant, inclosing a bill (H. R. 3041) for the relief of Nathan B. Abbott, herewith returned, that Mr. Abbott was promoted sergeant Company H, Twentieth Connecticut Volunteers, April 4, 1863, and is borne as such to January 22, 1865, on which date he was promoted and mustered in as a first lieutenant, and was mustered out as of that grade with his company, June 13, 1865.

A vacancy existed in Company D, Twentieth Connecticut Volunteers, for a second lieutenant, from April 21, 1864, to February 18, 1865, but the strength of the company being reduced below the minimum, numbering during that period not over seventy enlisted men, would not admit of filling said vacancy. (See act of March 3, 1863.)

The records further show that, on March 26, 1864, thirteen (13) enlisted men of Company D were transferred to the Fifth Connecticut Volunteers. This transfer was made, however, prior to the date a vacancy occurred for a second lieutenant, caused by the promotion and muster on April 21, 1864, of Second Lieutenant W. W. Spencer, to be first lieutenant.

There is no record of any service whatever rendered by Abbott in Company D, this being the only company in the regiment in which a vacancy existed during the time specified, he being borne on all the rolls of Company H as an enlisted man, and present for duty, to the date of his muster as first lieutenant of said company.

The claim has been rejected by this Department. (See copy of letter herewith from the Adjutant-General's Office, dated June 13, 1865.)

WM. W. BELKNAP,
Secretary of War.

WAR DEPARTMENT,
 ADJUTANT-GENERAL'S OFFICE,
 Washington, D. C., June 13, 1865.

SIR: I have respectfully to acknowledge the receipt of your letter of the 10th instant, asking to be allowed pay for services rendered as second lieutenant, for nine months and eleven days, but into which grade you had never been mustered.

In reply, I am directed to inform you that the regulations of the Department prohibit the receiving of pay by any officer until he has been properly mustered into service.

The records of this office show that the strength of your company, since the receipt of your commission by you, would not permit you to be mustered in as a second lieutenant. Your request, therefore, cannot be granted.

I am, sir, very respectfully, your obedient servant,

THOMAS M. VINCENT,
Assistant Adjutant-General.

First Lieutenant NATHAN B. ABBOTT,
Twentieth Connecticut Volunteers, Watertown, Connecticut.

Official copy:

THOMAS M. VINCENT,
Assistant Adjutant-General.

○

MISSISSIPPI LEVEES.

LETTER

FROM

THE SECRETARY OF WAR,

RETURNING

A bill (H. R. 3419) to aid in the rebuilding of the levees of the Mississippi River.

FEBRUARY 8, 1873.—Referred to the Select Committee on the Mississippi Levees and ordered to be printed, to accompany bill H. R. 3419.

WAR DEPARTMENT, *January 31, 1873.*

The Secretary of War has the honor to return to the House of Representatives a bill (H. R. 3419) to aid in the rebuilding of the levees of the Mississippi River, and to transmit to the House, for the information of the Select Committee on the Levees of the Mississippi River, the accompanying report of the Chief of Engineers, and its inclosure, copy of the report of Major Henry L. Abbot, Corps of Engineers, with the remark that the views of the Chief of Engineers, as contained in the last paragraph of his report, are in exact accord with his views upon the subject.

WM. W. BELKNAP,
Secretary of War.

A BILL to aid in rebuilding the levees of the Mississippi River, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That ———, together with such persons as may become associated with them for that purpose, together with their successors and assigns, are hereby created and erected into a body corporate and politic in deed and in law, by the name and title of the Mississippi Levee and Telegraph Company, and by that name shall have perpetual succession, and shall be able to sue and be sued, to plead and be impleaded, to defend and be defended, in all courts of law or equity within the United States, and may make and use a common seal, and may adopt by-laws for its regulation and government. Said corporation shall also have power to execute mortgages and deeds of trust upon its property and franchises, real and personal, and to borrow money and negotiate loans upon its bonds or other securities, contract and be contracted with, and purchase and hold real estate so far as may be necessary to carry out the objects of their incorporation, and shall be deemed to have a domicile in the States of Louisiana, Mississippi, Arkansas, Tennessee, Kentucky, and Missouri.

SEC. 2. That the capital stock of the said Mississippi Levee and Telegraph Company shall be ten million dollars, and shall consist of one hundred thousand shares of one hundred dollars each. The shares of stock shall be subscribed for on the books of said company and shall be transferable in such manner as the by-laws of said company shall prescribe; the ten persons herein first named as corporators, or any six of them, may give notice to the corporators to assemble at the city of New York, Saint Louis, or New Orleans, for the purpose of prescribing regulations for opening the books of subscription to said capital stock, at some convenient place, at such time as they may designate by public notice of at least ten days in a daily paper in each of the cities named. And the said books shall be kept open until the whole amount of said capital stock shall be subscribed, or such amount as they shall deem sufficient for the purposes of this act. A cash payment of five per centum on all subscriptions shall be paid at the time of subscribing to the person or persons properly authorized to receive the same. And whenever an amount of not less than five hundred thousand dollars shall have been subscribed to said capital stock, and five per centum of the same paid in as above prescribed, it shall be the duty of the above-named corporators (any six of whom shall constitute a quorum for the transaction of business) to call a meeting of the stockholders, at such time and place as they may deem proper, for the purpose of electing not less than five nor more than thirteen directors for said corporation, and each share of stock shall entitle the owner to one vote. The corporators herein named shall designate three of their number to act as inspectors of said election, which three inspectors so designated shall certify under their hands the names of the directors thus duly elected, and shall also notify them of their election, and the time and place of holding the first meeting of said board of directors, at which meeting the above corporators shall deliver to said directors the books of subscription to the stock of the said Mississippi Levee and Telegraph Company, together with the amount paid thereon, with a full report of their proceedings under this act; and thereupon the duties of the corporators hereinbefore named shall cease. And thereafter the said directors, with their successors or assigns, shall constitute the said body politic and corporate. The directors thus chosen shall hold their office for one year and until others are elected and qualified to fill their places. A majority of said directors shall constitute a quorum for the transaction of business.

SEC. 3. That the said directors shall, at their first meeting, elect from their own number a president and a vice-president. They may also, from time to time, elect a treasurer, secretary, chief engineer, and general superintendent, together with such other officers, agents, and employes as they may deem necessary, each of whom shall hold office or position only during the pleasure of said board of directors. The directors shall also have power to fill all vacancies in the board which may be caused by death or resignation, except as hereinbefore provided for. The treasurer and the secretary shall give such bonds, with security, as the board shall from time to time require. Meetings of the stockholders of said corporation, for the election of directors, and for the transaction of the business, shall be holden annually, and at such other times and upon such notice as may be prescribed by the by-laws. The directors of said corporation may require the subscribers to the capital stock to pay the amount by them subscribed respectively at such time, in such manner, and in such installments as they may deem proper. And if any stockholder shall refuse or neglect to pay any installment as required by a resolution of the board of directors, the said board may forfeit said stock for non-payment; and all previous payments shall revert, in law and equity, to the said corporation, under such regulations as may be adopted by the said corporation in their by-laws.

SEC. 4. That the company shall have for its objects the construction and maintenance of the levees and other works of the Mississippi, and the reclamation of the delta-lands from overflow by the waters discharged from the Mississippi River.

SEC. 5. That said corporation is hereby authorized and empowered to lay out, locate, and construct levees and a line of telegraph from Cape Girardeau, in the State of Missouri, to Fort Jackson, in the State of Louisiana, on both sides of the Mississippi River, where the same may be necessary to secure the country from inundation, which levee shall follow the river-banks as near as may be practicable and judicious. The said levees shall be constructed according to the plans and in the manner hereinafter provided in this act; and the right of way through the public lands is hereby granted to said company wherever it may be necessary to construct levees as provided in this act; and the right of way through other lands may be acquired in accordance with the laws of the State where the same may be situated.

SEC. 6. That the company shall perform such offices and build such structures and levees as may be prescribed by a commission of engineers, to be constituted as follows: The Secretary of War shall assign, as commissioners, engineer officers, one who shall be known as supervising engineer, and one for each levee district. The governors of the States of Missouri, Arkansas, Mississippi, and Louisiana shall nominate to the Secretary of War civilian engineers, who, upon passing the proper examination as herein prescribed, shall be appointed members of the commission: the governor of Missouri

shall nominate one; the governor of Arkansas shall nominate one; the governor of Mississippi shall nominate one, and the governor of Louisiana shall nominate three commissioners: *Provided*, That if any State fail to nominate and provide for the salary of any commissioner herein prescribed, then the Secretary of War, upon nomination of the Chief Engineer of the United States Army, shall appoint said civilian commissioner to be examined as above, who shall be paid by the Engineer Department of the United States.

SEC. 7. That the commissioners thus appointed shall constitute a board of engineers, skilled in the science and practice of their professions. The engineer designated as supervising engineer by the Secretary of War shall be chief of the commission. The commission shall establish and hold their chief office in the city of New Orleans, and shall establish the offices of the sub-commission in each levee district; they shall provide by-laws for governing their mode of operations, in performing their duties under this law; they shall meet once a year, and oftener if called together by the chief commissioner; they shall have a secretary, and such employés as they may require; they shall devise plans by means of levees, and like works, for the reclamation of the great body of lands styled "The Delta of the Mississippi River," and such as are liable to inundation by the high waters of that river. And for this purpose they shall divide the area into six levee districts or natural basins, as hereinafter described, namely:

District number one: All the alluvion below Baton Rouge, and on the left of the river, to the Gulf of Mexico, and to be styled the New Orleans district.

District number two: All of the alluvion below Red River, and west of the Mississippi to the Gulf of Mexico, and to be styled the Donaldson district.

District number three: All the alluvion in Louisiana north of Red River and west of the Mississippi, and to be styled the Delta district.

District number four: All the alluvion east of the Mississippi, below Memphis and above Vicksburgh, and to be styled the Yazoo district.

District number five: All the alluvion below the Saint Francis and above latitude thirty-three north, and west of the Mississippi River, and to be styled the Arkansas district.

District number six: All the alluvion above the Saint Francis and below Cape Girardeau, to be styled the Saint Francis district.

The offices in each district to be fixed by the commission, and changed at option.

SEC. 8. That the commission shall prescribe rules and regulations for the general conduct of the surveys of the Delta, and for the mode of constructing works, the form, dimensions, and material to be used in construction, the mode and extent of expenditures by the sub-commissions, and shall fix and determine the responsibility, and provide rules and regulations for the government of officers and employés, and shall make all other necessary rules and regulations.

SEC. 9. That sub-commissions shall be composed of one United States engineer, and one civilian engineer, to act in each levee district, the commissioner for Missouri, with one United States engineer, in the district above the mouth of the Saint Francis; the commissioner for Arkansas, with one United States engineer, in the district below the Saint Francis, and above latitude thirty-three north, on the right or west of the Mississippi River; the commissioner for Mississippi, with one United States engineer, to serve in the district below Memphis, and above Vicksburgh, on the left or east of the Mississippi; the commissioners for Louisiana, to be assigned to duty, with one United States engineer each, to the district north of Red River, west side, to the district below Red River, right or west side, and the district below Baton Rouge, left or east side of the Mississippi River, the latter two districts extending to the Gulf.

SEC. 10. That the sub-commissioners shall have their offices at such points as may be fixed by the commission and shall be charged with the execution of all the surveys required within the several districts, the location of all levees and works therein, not provided especially by the commission. They shall have executed complete maps, plans, and profiles of the works to be constructed by the Mississippi Levee and Telegraph Company, and shall make the plans and specifications, according to instructions from the president or the commission; one for the company, and duplicates in all cases, by tracing, for the chief officer and for the Engineer Department of the United States Army.

SEC. 11. That each sub-commission shall employ such civil engineers, and at such compensation as shall be prescribed by the commission or authorized by the president of the board; each employé to be examined by the commission as to fitness for the specific duties required, unless he shall hold a certificate as "Levee engineer" from the examining committee of the board, to be detailed by the president. They shall have such organization and perform such duties as the commission shall prescribe.

SEC. 12. That each sub-commission shall complete the reconnaissances, surveys, and estimates for each succeeding year's work, and return the same to the chief officer on or before the twenty-fifth day of October, annually. The sub-commissioners shall decide, by lot, which shall be sub-chief, when both are present, and in the absence of either the other shall act as chief for executive functions only; afterward the oldest

in the service shall be chief. All measures to be adopted shall require their joint action and signature. In all cases of difference between the sub-commissioners in matters of engineering, the supervising engineer shall decide the matter of difference, and in all other cases the president of the company shall decide. Each and every commissioner shall pass over the levees and works of his entire district, annually, for detailed reconnaissance, and as often as the nature of the works may demand. But both shall not absent themselves from their office at the same time, without special permission of the president.

SEC. 13. That the commissioners and all their employés shall keep exact accounts of their necessary expenditures, and shall account and vouch for the same, in the manner and under the regulations of the War Department. They shall cause monthly estimates to be made of the work performed by the Mississippi Levee and Telegraph Company, since the last estimate, and these shall be forwarded to the chief office and cumulated on or before the tenth day of the month; and the president shall draw his warrant upon the United States Treasury for the amount in favor of the Mississippi Levee and Telegraph Company, reserving always twenty per centum on all works unfinished. This warrant, approved by the Chief of the United States Engineers, shall be paid out of any moneys in the Treasury of the United States appropriated to this purpose.

SEC. 14. That the commission shall provide for monthly requisitions for funds needed in payment of laborers, clerks, stationery, assistant engineers, and all other expenses incident to the office of the commission and each sub-commission. The commission shall report monthly the joint reports of the sub-commissions; and shall report the progress of works, and the general condition of the alluvial country to the Engineer Department, United States Army, and shall publish abstracts of the same.

SEC. 15. That the Mississippi Levee and Telegraph Company shall, by their officers, agents, and their chief engineers of the districts, apply at the offices of the sub-commissioners for such maps, plans, profiles, and specifications of works as may be prepared for them, and they shall, as early thereafter as practicable, proceed to contract said works, and complete them with dispatch.

SEC. 16. That the district chief engineers of the company shall, monthly, detail such assistant, or proceed himself, with the assistant commission engineer, to measure the amount of work done, in such manner, time, and order as that the work of monthly estimates shall be completed on or before the first day of each month. These, when revised by the sub-commissioners, shall be forwarded to the chief office within the first five days of each month.

SEC. 17. That sub-levee districts, of convenient length, shall be created for the assistant engineers of the commission and of the company, to visit, watch, and direct the progress of construction, and to see that the material used and the performance of the work shall be in accordance with the specifications. And every engineer employé of the commissioners shall have power and shall be instructed to arrest and report any fraud or laches in the construction of the works, or avoidable delays in their prosecution.

SEC. 18. That the company shall keep an adequate force on the levees during high waters, and an adequate amount of material for the prompt arrest of any crevasse that may occur; and the company shall be responsible for damages actually proved before the courts as caused by the laches of the company.

SEC. 19. That whenever, in the opinion of the commission, it shall be necessary to destroy valuable improvements, or to expose the same to inundation, or to exclude improved lands in order to construct new levees, said improvements shall be valued or damages estimated according to the average of the State assessments for the five years last preceding in which taxes shall have been paid, and adding twenty per centum thereto; the amount so obtained shall be paid to the owner under such rules as may be prescribed by the company, and approved by the Engineer Department of the United States Army: *Provided, however,* That no payment shall be made upon lands or improvements existing within three hundred feet of the river's bank when the survey for the new levee shall be made: *Provided further,* That thirty days' notice shall be given for the removal of improvements on such lands.

SEC. 20. That the commission shall have power to close all outlets to the Mississippi River, where, in their judgment, the reclamation of lands of the Delta will justify the same.

SEC. 21. That should the commission deem it necessary to create reservoirs in controlling the inundations of the Mississippi, they shall make an estimate of the areas to be thus submerged, and the cost of purchase of the lands required, and submit the matter to Congress in the estimates for the next year's works, as a separate item for an appropriation.

SEC. 22. That the company shall be authorized to contract, on equitable terms, with any company now existing, created for the purpose of building levees and being incorporated by or in accordance with State laws; and shall be authorized to construct through said companies or to buy out their charters and privileges.

SEC. 23. That the Mississippi Levee and Telegraph Company shall be paid for their

works and levees on the basis of fifty cents per cubic yard for earth-work, and fifty dollars per thousand for lumber-work, and ten cents per cubic foot for timber-work. In all cases of work that is extra-onerous or not estimable in either of the above forms, under rules established by the commission, it shall be so reported, and computed in cubic yards, lumber or timber, as the case may be, and the estimate shall contain the extra-onerous work as a special item in each work or estimate. All operations of the commissions to be approved by the Chief Engineer of the United States Army.

SEC. 24. That the company shall commence the construction of said levee at three points—Cape Girardeau, Arkansas River, and Red River, and complete not less than one hundred miles of levee within two years from the passage of this act, and continue to construct each year thereafter a sufficient number of miles to secure its final completion within five years: *Provided*, That Congress shall appropriate a sufficient amount of money to enable the company to build the amount of levees proposed at the rates provided in the preceding section of this act.

SEC. 25. That the company shall procure properly authenticated copies of this act and charter, and shall take such measures as shall early obtain the right of jurisdiction herein contemplated in each of the several States named, and a formal recognition of this charter; and they shall file the same in the office of the Secretary of War of the United States.

SEC. 26. That the said levee and telegraph-line shall be deemed and considered a national and public work, and no tax shall be imposed by virtue of any State authority upon the property of said company used in the construction of said public work.

SEC. 27. That if any person shall willfully do or cause to be done, any act or acts whatever whereby any levee, structure, or other work, or any engine, machine, or other property appertaining to said levee or telegraph-line, shall be injured, impaired, or destroyed, the person or persons so offending shall be guilty of a misdemeanor, and, on conviction thereof by any court of competent jurisdiction, shall be punished by fine not less than five hundred nor more than one thousand dollars, or by imprisonment not less than one year nor more than five years, or both, at the discretion of the court, and shall also forfeit and pay to the said company, its successors, or assigns, double the amount of damages sustained by means of such offenses, to be recovered by said company, with costs of suit, by action of debt or case. In all actions at law, either by or against the company, suits may be brought in either the State or United States courts at the option of the plaintiff.

SEC. 28. That said Mississippi Levee and Telegraph Company shall have power to issue bonds secured by mortgage on all or any portion of the property and franchises of the said company; the said bonds shall have not less than twenty years to run, and shall bear not more than seven per centum interest per annum, payable semi-annually, at such times and places as said company may determine, the principal and interest to be paid in gold: *Provided*, That when such mortgages are made and executed by the company, they shall be filed and recorded in the War Department of the United States, which shall be sufficient evidence of their legal execution, and shall confer all the rights and property of said company as therein expressed.

SEC. 29. That said corporation shall make an annual report of their operations to the Secretary of War, in such form and containing such items of information as he may prescribe; said report to be verified by the certificates, under oath, of the president, treasurer, chief engineer, and general superintendent of said corporation.

SEC. 30. That this act shall take effect from the date of its passage, and may be altered, amended, modified, or repealed by the Congress of the United States as the public good may require.

SEC. 31. That the sum of ——— dollars is hereby appropriated from the Treasury of the United States for the purposes herein named for the fiscal year ending June thirtieth, eighteen hundred and seventy-four.

[INDORSEMENT.]

Respectfully referred to General Humphreys, Chief of Engineers, who will please give his views as to the propriety of the passage of this bill to the House Committee on Mississippi Levees.

Any suggestions for modification or improvement will be gladly received.

FRANK MOREY,

Chairman House Committee on Levees of the Mississippi.

OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., January 28, 1873.

SIR: I beg leave to transmit herewith H. R. 3419, "a bill to aid in rebuilding the levees of the Mississippi River," referred to me by the chairman of the Committee on Levees, and respectfully request, if it meet your approval, that it be returned to him with this communication.

The bill was referred to Major Abbot, of the Corps of Engineers, for report, and his reply, a copy of which is submitted, contains valuable suggestions.

The bill in substance proposes that the United States shall enter into a contract with certain parties, not yet named, to build the levees of the Mississippi River, from Cape Girardeau to the Gulf of Mexico, at a certain fixed price, the location, form, dimensions, and character of the levees to be fixed by a commission composed of seven United States engineer officers and six civil engineers, virtually appointed by the governors of the States in which the levees are to be built, the ranking United States engineer presiding over the commission. This commission is to supervise the construction of the levees, and pay the contractors from appropriations made by Congress.

Since the levees are to be built by appropriations of Congress, I think the usual method of executing the engineering works of the Government would be simpler, easier, more economical, and more efficient, and that the work would be in every respect more satisfactorily performed in that way than in any other.

Very respectfully, your obedient servant,

A. A. HUMPHREYS,
Brigadier-General and Chief of Engineers.

Hon. W. W. BELKNAP,
Secretary of War.

WILLET'S POINT, NEW YORK,
January 24, 1873.

GENERAL: I have the honor to return herewith the bill (H. R. 3419) to aid in rebuilding the levees of the Mississippi, forwarded with your letter of 17th instant, with the following report:

I have given no study to the financial features of the bill, but would suggest that there ought to be some provision for the payment of the bills of the commission without requiring an annual appropriation of Congress. The company might, by their bonds, raise enough money to continue work, even if an annual appropriation should fail or prove to be inadequate; but in such a case the commission would have to discharge its employes, and there would then be no Government supervision.

I would also invite attention to the absence of any provisions regulating the telegraph.

The general plan of the commission seems to be admirable.

Some provisions respecting a general inundation, which might occur in a great flood year, would seem to be required, as unexpected outlay to secure work already done might be called for without corresponding appropriations.

I think section twenty-four requires careful consideration. The effect of beginning work at the three points named would certainly be to inundate the Yazoo bottom-lands, and probably to work great injury to Lower Louisiana before the lower levees could be raised to the requisite

height to restrain the increased floods. Undoubtedly, if no levees existed, the proposed plan would be the best; but under existing circumstances it admits of doubt whether some raising of the lower levees should not precede the pouring of an increased volume upon them.

The division of the region into levee districts is made with excellent judgment, but the work in the "Arkansas district" below Arkansas River would have to be pushed forward before the "Delta district" could be protected by its own system.

I am, general, very respectfully, your obedient servant,

HENRY L. ABBOT,

Major of Engineers.

General A. A. HUMPHREYS,

Commanding Corps of Engineers.

REMOVAL OF CERTAIN CHIPPEWA INDIANS.

L E T T E R

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

A memorial of the legislature of Dakota, praying that the Pembina band of Chippewa Indians be removed from the lands on the Dakota side of the Red River of the North to the White Earth reservation in Minnesota.

FEBRUARY 8, 1873.—Referred to the Committee on Indian Affairs and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., January 30, 1873.

SIR: I have the honor to inclose herewith a copy of a letter from the Acting Commissioner of Indian Affairs, dated the 28th instant, inclosing a copy of a memorial of the legislature of Dakota, approved January 6, 1873, addressed to the President of the United States, praying that the Pembina band of Chippewa Indians be removed from the lands on the Dakota side of the Red River of the North to the White Earth reservation in Minnesota.

Agreeably to the recommendation of the Acting Commissioner, the memorial is respectfully transmitted for consideration, in connection with Department letter of the 13th, addressed to the Speaker of the House of Representatives, submitting an estimate of \$35,000 for the accomplishment of the purpose contemplated by the memorial.

I have the honor to be, your obedient servant,

C. DELANO,
Secretary.

Hon. JAS. G. BLAINE,
Speaker of the House of Representatives.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., January 28, 1873.

SIR: I have the honor to acknowledge the receipt, by reference from you, of a copy of a memorial by the legislative assembly of the Terri-

tory of Dakota, approved January 6, 1873, to the President of the United States, praying that the Pembina band of Chippewa Indians might be removed from the lands on the Dakota side of the Red River of the North, to the White Earth reservation in the State of Minnesota.

I respectfully recommend that the said memorial be submitted to Congress for consideration, in connection with the recommendation of this office upon the subject to the honorable Secretary of the Interior, dated the 11th instant, which was transmitted to Congress with Department letter of the 13th instant.

The memorial is herewith returned.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

A MEMORIAL to the President of the United States relative to the Pembina band of the Chippewa Indians.

To His Excellency the President of the United States:

Your memorialists, the legislative assembly of the Territory of Dakota, would most respectfully represent that the Pembina band of Chippewa Indians are still occupying the lands on the Dakota side of the Red River of the North, which were ceded by the said band and the Red Lake band of the Chippewas, in their treaty with the United States in 1863, and that the occupation of said lands by said Pembina band is a great nuisance to the white settlements on the Pembina and Red Rivers, and also retards the establishment and growth of new settlements on the ceded lands.

Your memorialists therefore pray that said last-named band of Indians be removed from the ceded lands, and settled upon their reservation at the White Earth agency, in Minnesota, according to the stipulations in said treaty.

And your memorialists, as in duty bound, will ever pray.

Approved January 6, 1873.

I certify that the above is a true copy of a memorial passed at the tenth session of the legislative assembly of the Territory of Dakota, and approved by me on the 6th day of January, A. D. 1873.

In testimony whereof, I have hereunto set my hand, and caused to be affixed the great seal of the Territory, this 10th day of January, A. D. 1873.

[SEAL.]

JOHN A. BURBANK,
Governor.

Attest:

EDWIN S. MCCOOK,
Secretary.

PRESERVATION OF ARMY CLOTHING.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

An estimate to carry out the plans adopted for the preservation of Army clothing and equipage.

FEBRUARY 8, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT,
 Washington City, February 4, 1873.

SIR: I have the honor to transmit herewith an estimate prepared by the Quartermaster-General of an amount required to carry out the plans adopted for the preservation of Army clothing, and to respectfully urge its early consideration.

Should Congress deem it proper to make the appropriation, I recommend that it be made available on the approval of the act, so that the process may be at once applied to the stock of clothing material now on hand.

A pamphlet copy of the report of the board appointed to consider this subject accompanies the estimate.

Very respectfully, your obedient servant,

WM. W. BELKNAP,
 Secretary of War.

The SPEAKER of the House of Representatives.

Estimates of appropriations required for the preservation of clothing and equipage on hand in the Quartermaster's Department.

CLOTHING AND EQUIPAGE.

QUARTERMASTER-GENERAL'S OFFICE,
 February 3, 1873.

For the preservation of clothing and equipage by the moth and mildew-proof process, adopted and now in use by the War Department, in conformity with the recommendation of the board of which Colonel R. B. Marcy, inspector-general, was president \$300,000

M. C. MEIGS,
 Quartermaster-General.

The Honorable the SECRETARY OF WAR,
 Washington, D. C.

Official reports and documents as to the preservation of the clothing and equipage of the Army and Navy of the United States, by the process of George A. Cowles & Co., as adopted by the War and Navy Departments, for the prevention of destruction by moth and mildew, and rendering the same water-repellent.

OFFICE OF GEORGE A. COWLES & COMPANY,
217 Levant Street, Philadelphia, Pennsylvania, January, 1873.

The great enemy to the clothing and equipage of all armies is the moth in woolen fabrics, and mildew in canvas. The destruction in the Army material of the United States for the past twelve years, from these causes, has been estimated as high as thirty millions of dollars; and although the Quartermaster's Department used every known means to arrest this waste, no plan was found to avail until the introduction of the process of George A. Cowles & Co., which was presented as a moth-proof, mildew-proof, and water-repellent; economical in its application, the expense bearing no proportion to the value of the goods treated. Four years ago the Department commenced a series of rigorous experiments, to determine if our claims would stand the test of experimental and practical use; and the result has been that the Quartermaster-General and the Secretary of War have indorsed and adopted our process as being all that it was claimed to be: a preventive against the enormous destruction of woolen and cotton fabrics, and a safeguard in the future against loss either from moth or mildew, besides rendering the goods water-repellent.

The amount of Army woolen and cotton goods on hand June 30, 1872, (the latest official returns,) and which can be saved by our process, but which is as yet unprepared and liable to destruction, especially during the approaching spring and summer, (the period when the moths are most active,) is given by General J. D. Bingham, in charge of the clothing branch of the Quartermaster-General's Office, as of the value of over twenty-three millions of dollars. (See page 31.)

We submit the proceedings and report of a board of officers of high rank, appointed last month by the honorable the Secretary of War to examine thoroughly into the merits of our process as applied to Army clothing and equipage. To the report we have added all the official correspondence and other official data upon the subject, so as to give a clear and intelligent explanation of the process, a statement of the severe and exhaustive tests to which it has been officially subjected, and a history of the matter from the first experiments made by direction of the War Department down to the present time.

While the report is full, comprehensive, and emphatic in our favor, yet the evidence shows it by no means exaggerates the facts of the case. The testimony of the late chief inspector at the principal clothing depot, and of the present chief inspector, explicitly declares that our process has the effect of strengthening the fabric treated; while an overwhelming mass of testimony proves it to be an absolute safeguard against mildew.

It is gratifying to us to find that our process has withstood all the tests; and that the minute and searching examination of witnesses under oath—employés of the Government—just had by the board, has confirmed every statement and claim we had heretofore made in connection therewith, and has resulted in a unanimous report, which concedes the success of our process, its great value to the Government, and recommends its continued use by the War Department; the report having been indorsed by the Quartermaster-General and approved by the Secretary of War.

For the past year we have also prepared all the clothing for the use of the Navy, and we present the following letter from Paymaster-General Dunn as evidence of the satisfaction of the Navy Department with our process:

"NAVY DEPARTMENT, BUREAU OF PROVISIONS AND CLOTHING,
" Washington, January 18, 1873.

"GENTLEMEN: The Bureau has received a copy of the report of the board of officers of the Army, convened at Schuylkill arsenal, Philadelphia, on December 18, 1872, of which General R. B. Marcy was president, relative to clothing prepared by your process for its preservation.

"The report confirms the Bureau in its opinion of the great value of your process for preserving clothing, and it will continue to have all the new navy-cloth clothing prepared in that way.

"Very respectfully,

"EDWARD T. DUNN,
" Paymaster-General United States Navy.

"Messrs. GEO. A. COWLES & Co.,
" Philadelphia, Pennsylvania."

Our business has been in operation since 1864, during which time we have been largely engaged in applying the process to woolen and cotton goods. We have hundreds of testimonials from business firms and private individuals, as well as from mem-

bers of the New York police force, who, through our process, have been enabled to dispense with rubber coats—at once unhealthy and uncomfortable—and who testify that they are kept dry in the heaviest rains when wearing our prepared clothing. Valuable, however, as these statements of private persons are, we consider the official reports of the War and Navy Departments as more important and conclusive testimony; and as such we confine ourselves in these pages to official documents alone.

The documents show that the scientific and distinguished head of the Quartermaster's Department exercised the utmost caution in having our process fully examined before indorsing its merits; and, after an exhaustive series of tests for years, felt it his duty to report to Congress, at its last session, that he considered it "a judicious and economical measure" to make appropriations for the application of the process, there being in store at the principal depots of the Department several million dollars' worth of clothing liable to be destroyed by moths, to say nothing of the preservation of new clothing and material, and the vast saving in canvas, which, if made mildew-proof, would last for years, while unprepared it is seldom serviceable beyond a single season, and in many instances is destroyed by mildew in a few months.

GEORGE A. COWLES & CO.

Report of the military board upon the merits of the preservative process of George A. Cowles & Co. as applied to Army clothing and equipage; together with the approval of the Quartermaster General and the honorable the Secretary of War.

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., January 10, 1873.

GENTLEMEN: In compliance with your request of the 2d instant, I herewith inclose copies, extracts, and accompanying documents, of the report of the board of officers convened at Schuylkill arsenal, on the 18th ultimo, to investigate your process, in its application to Army clothing and equipage.

Very respectfully, your obedient servant,

M. C. MEIGS,

Quartermaster-General, Brevet Major-General, U. S. A.

Messrs. GEO. A. COWLES & Co.,
217 Levant street, Philadelphia, Pa.

WASHINGTON, D. C., December 30, 1872.

GENERAL: I have the honor to transmit herewith report and proceedings of the board convened at Schuylkill arsenal, Philadelphia, in compliance with part 5, Special Orders 329, current series, War Department, together with all the papers laid before the board by you.

Very respectfully, your obedient servant,

R. B. MARCY,

Inspector-General U. S. A., President of the Board.

Brigadier-General M. C. MEIGS,
Quartermaster-General U. S. A., Washington, D. C.

WASHINGTON, D. C., December 30, 1872.

The board convened in compliance with paragraph 5, Special Orders No. 329, War Department, current series, for the purpose of examining into the condition of certain clothing, which has been subjected to George A. Cowles & Co.'s process for its preservation, has the honor to submit the following report:

The board assembled at Schuylkill arsenal, Philadelphia, on the 19th instant, and after having been duly sworn to a full and impartial investigation of the subject before it, proceeded to take the sworn testimony of the officers in charge, employés, and others, from whom it was supposed reliable evidence could be elicited touching the process and its results; all of which is fully set forth in the detailed record of proceedings hereto appended. The officers in charge of the arsenal, and Cowles & Co., were asked to inform the board of any evidence within their knowledge bearing on the questions before it.

A careful consideration has been given by the board to the reports and other documentary evidence submitted by the Quartermaster-General, and the papers laid before it by Cowles & Co., and General Easton, the officer in charge of the arsenal.

The board also carefully and extensively examined prepared clothing that had been

baled for sixteen months, together with a large amount that had lain loosely piled in the arsenal for the last six months, much exposed to the action of moths.

Baled and loose unprepared clothing was examined in like manner. No moth-ravages whatever were found in the baled prepared clothing, while in the unprepared it was extensive. In the loose prepared clothing slight evidences of moths were found, and two or three living moths, but no extensive damage. The ravage was confined to loose foreign "fluff" on the garments, and slight attacks on the nap of the cloth, but in no case was the body of the fabric injured.

The factory of Cowles & Co. was visited by the board, and their process fully and minutely explained and exemplified by the firm. They also exhibited to the board a large number of overcoats in a moth-eaten condition, which, the evidence shows conclusively, had been sent to them in that condition; a portion of these coats were badly eaten.

After this careful and critical personal examination, and mature deliberation upon all the evidence the board has been able to elicit, it has arrived at the following unanimous conclusions, viz

That clothing has become damaged by moths, in rare instances and to a slight extent, since being prepared by the process of Cowles & Co.; but the cases are so very exceptional, and the damage so slight, as to induce the belief that moths will not fasten themselves on the fiber to any serious extent, or do any material injury to the body of the cloth.

On the other hand, the evidence is abundant, continuous, clear, and positive, that the prepared goods withstand the action of moths, are in a measure water-repellent, and resist mildew far longer than the unprepared; that the process does not discolor the cloth, creates no odor, does not diminish the strength of the material, and is no injury to the wearer.

The board regards the process a good one, and is of the opinion that it should be continued so long as a better or cheaper does not offer.

In support of this view of the case, the board would respectfully refer generally to the volume of testimony noted in the appendix, and particularly to the strong and pointed statements of Neal Campbell, Captain Van Antwerp, F. S. Johnston, William Preston, and Captain Alligood.

The few prepared garments so slightly injured, when compared with the great number so well protected, even though unusually exposed, leads to the conclusion that their injury is due to some little defect in the preparation, leaving parts exposed to the action of the moths, rather than to the process itself, which has so well withstood the rigorous tests set forth in the reports and evidence; and it shows conclusively that the process is highly valuable that protects the clothing at so slight a percentage of loss, compared with the great losses of the past.

The board is not unmindful of the reports of Captain Alligood; but from the examination of the clothing, and in the face of the evidence that moth-eaten goods have been sent to the factory, and that a large quantity is now there, the board cannot but be of the opinion that much of the damage found on prepared articles existed before they were sent to Cowles & Co.'s factory.

Nor have the adverse reports of Captain E. B. Carling, assistant quartermaster, Lieutenant R. E. Armstrong, Lieutenant O. E. Michaelis, and Captain Dupont been disregarded; but a careful examination of each case, by direction of the Quartermaster-General, proves that the articles reported on did not bear the mark or stamp of Cowles & Co.

Aside from this apparently adverse evidence, which appears to be fully answered, the testimony throughout sustains the conclusions reached by the board.

The board respectfully recommends that further tests be made, not so much to establish the benefits of the process, which seem pretty well proven, but to ascertain what actual loss under ordinary exposure may occur.

In making such tests, prepared and unprepared garments should be taken and carefully examined, to ascertain that they are not moth-eaten or in any way injured; then, packed in the same way or exposed to like other tests, and kept at various principal points, and in warm climates, until one or the other or both shall become unmistakably and extensively damaged by moths.

Much complaint of moth-damage to garments already prepared will doubtless arise, for the reason that many moth-eaten ones have been sent to the factory of Cowles & Co. and prepared, and now bear the company's stamp. This clothing will be sent out, and when found in a damaged condition by those not cognizant of the facts, the reports will be against the process, and the company will suffer in consequence.

* * * * *

R. B. MARCY,

Brevet Major-General, Inspector-General U. S. A., President.

RUFUS INGALLS,

Brevet Major-General, Assistant Quartermaster-General U. S. A.

J. G. C. LEE,

Brevet Lieutenant-Colonel, Assistant Quartermaster U. S. A., Recorder.

WASHINGTON, D. C., December 30, 1872.

Colonel R. B. Marcy, Inspector-General United States Army, president of the board, transmits report and proceedings of the board convened at Schuylkill arsenal, Philadelphia, by paragraph 5, Special Orders No. 329, current series, War Department, (to examine into the effect of the process of Cowles & Co., for preserving woolen garments from the ravages of moths, and for other purposes.)

The report and proceedings are respectfully forwarded to the honorable the Secretary of War.

I concur in the opinions and recommendations of the board, and recommend their approval by the Secretary of War.

M. C. MEIGS,
Quartermaster-General, Brevet Major-General U. S. A.

The Secretary of War concurs in the views and recommendations of the board, and directs that they be carried out. The Secretary also grants authority to the Quartermaster-General to furnish Cowles & Co. copies of so much of the report and accompanying papers as he may deem advisable.

By order Secretary of War.

H. T. CROSBY,
Chief Clerk.

Official copy and extract of letter and indorsements.

J. D. BINGHAM,
Brevet Brigadier-General and Quartermaster.

[Special Orders, No. 329.]

Proceedings of the board of officers convened at Schuylkill arsenal, Philadelphia, Pennsylvania, in pursuance of the following order :

WAR DEPARTMENT, ADJUTANT GENERAL'S OFFICE,
Washington, December 16, 1872.

* * * * *

5. A board to consist of Colonel R. B. Marcy, Inspector-General; Colonel Rufus Ingalls, Assistant Quartermaster-General; Captain J. G. C. Lee, assistant quartermaster, will assemble at Schuylkill arsenal, Philadelphia, on the 18th day of December, 1872, or as soon thereafter as practicable, to examine into the condition of certain clothing which has been subjected to George A. Cowles & Co.'s process for its preservation.

The board will report whether or not any of the clothing has become damaged since being prepared by the process mentioned, from causes against which it is guaranteed as a protection, and whether or not in their opinion it is advisable to continue its use.

The Quartermaster-General will lay before the board all papers on file relating to the subject, and will notify the contractors interested of the meeting of the board. The board will forward their report to the Quartermaster-General. The junior member of the board will act as recorder.

By order of the Secretary of War.

E. D. TOWNSEND,
Adjutant-General.

Official :

W. D. WHIPPLE,
Assistant Adjutant-General.

SCHUYLKILL ARSENAL, PHILADELPHIA,
December 19, 1872.

The board met at 10 o'clock a. m. Present : Colonel R. B. Marcy, Inspector-General; Colonel Rufus Ingalls, Assistant Quartermaster-General; Captain J. G. C. Lee, assistant quartermaster.

The members were then sworn to a faithful and impartial discharge of their duty.

The papers submitted by the Quartermaster-General were then laid before the board by the president.

Captain C. A. ALLIGOOD, military store-keeper United States Army, was then called before the board and duly sworn, when he made the following statement :

My reports, made from time to time to Colonel L. C. Easton, Assistant Quartermaster-General, are true to the best of my knowledge and belief. The overcoats spoken of therein bore the marks of George A. Cowles & Co., as having been submitted to their process. All coats were prepared by them after being made up. The trousers were made up in this arsenal, from cloth that had been submitted to the process in the piece. I do not know whether at this late season there is any clothing in the arsenal on which moths are at work or not. I think it is now too cold. I can exhibit clothing with Cowles & Co.'s marks on that are moth-eaten. I presume that many coats were sent to Cowles & Co. that were somewhat moth-eaten. I arrive at this conclusion from incidents during the investigation of this matter. I am satisfied that other garments were eaten since they were prepared. I have seen moths in the larvæ state, in the chrysalis state, and in the cocoon, on clothing prepared by Cowles & Co., but cannot tell on how many garments. The instances were rare. I do not know, but it is my impression that the authorities say the moths remain dormant during the cold weather, yet keep adding layers or sections to the cocoon. The larvæ, as I understand it, is the naked worm, without surroundings, or external coverings.* The chrysalis state is the worm in the cocoon. The cocoon is similar in color to the material on which it is working. The cocoon appears to be made of the material of the garment. I don't know whether it is the material itself or transformed in any way. I am led to believe that some clothing sent to Cowles & Co. had been eaten somewhat by moths previous to being sent, from the facts that the inspectors are liable to carelessness in inspecting, and the presence of coats at the factory of Cowles & Co., as seen by the chief clerk and inspector, so injured. I do not remember whether the chief clerk and inspector, in their verbal report, state that they were satisfied that the goods were so short a time in the possession of Cowles & Co. that they could not become moth-eaten while there. I do not know how they could tell how long these coats had been in Cowles & Co.'s possession, as that firm had been receiving coats for months.

Question by the board. Why was the report of the chief inspector and the chief clerk a verbal one ?

Answer. I did not require them to make a written one.

Q. by B. Did you order them to make a report in writing before they called at Cowles & Co.'s factory ?

A. Do not remember whether I did or not.

Q. by B. Where is your chief clerk, W. B. Collins ?

A. I do not know. He sent me a note that he could not be here to-day. I think he has gone to Washington.

Q. by B. You have stated that you do not allow many goods to lie over. How many garments are at present in the arsenal unbaled ?

A. I do not know. There is a large number.

Q. by B. Is there anything in the appearance of the moth-tracks to indicate whether their work was done before or after being prepared ?

A. Yes, sir. The presence of live moths in the various stages; the location of the moth-eaten parts. The fact that the trousers were made out of material prepared by Cowles & Co., and has passed since then through so many hands—the cutters, the makers, and the inspectors—prior to being stored, that the discovery of damage would have been almost inevitable had it occurred before being prepared.

Q. by B. During the interval from the manufacturers to the time moths were discovered, were the goods exposed to moths ?

A. They were, because, being prepared by this process, it was not thought necessary to protect them from the ravages of the moths.

Q. by B. Was it not possible, or even probable, that the moths were attracted to these goods by foreign material which had fallen thereon ?

A. It is possible on the coats; on the pants improbable, and I think impossible.

Q. by B. Do you believe that Cowles & Co.'s preparation of Army fabrics serves to make them water-repellent ?

A. I think, from the best evidence I have, that the preparation renders them water-repellent.

Q. by B. Do you think that the process renders fabrics mildew-proof ?

A. I do not know. I am informed by the employés, who claim to have tested it previous to my arrival at this place, that the tests establish the mildew-preventive qualities of the preparation.

NEAL CAMPBELL, late inspector at the Schuylkill arsenal, was then called before the board and duly sworn.

* See Harris's statement as to the habits of the clothes-moth, p. 18.

Question by the board. State your name, and the position you formerly held at this arsenal?

Answer. My name is Neal Campbell. I was chief inspector here.

Q. by B. State to the board all the facts within your knowledge in relation to the clothing and equipage that have been submitted to the process of George A. Cowles & Co., giving dates of application of process, date of examinations, and results.

A. The great-coats were the principal things that I examined. They were submitted to the process about August 11, 1869. Four of them were exposed among clothing covered with moths until December, 1870, when I examined them, and found no indication whatever of moths on them. The other clothing in which they were buried was being eaten up by moths. I caught twelve or fifteen live moths with cocoons, and put them in one of these four great-coats treated by the process, and put it aside for five weeks; when opened and examined, I found some of the moths alive and some dead, and the coat untouched, except in one small place, requiring close scrutiny to find it. This was in the following summer of 1871. All my reports to Captain Van Antwerp are true.* I have never discovered live moths at work on the clothing prepared by Cowles & Co. I have never seen live moths on the prepared clothing, except when put on for experiment. I experimented on clothing prepared and unprepared, and invariably found moths at work on the unprepared. I regard the preparation as a certain preventive to the action of moths. I was prejudiced against the process at first, and for that reason submitted the clothing to the most rigorous tests. It does not discolor the clothing. There is no disagreeable odor. I think the fabric is as strong after the process as before. Not many garments were prepared, but a large amount of kersey. I have been on duty at this arsenal off and on since 1830, most of the time. Have handled large amounts of cloth and clothing. I was on duty here for two and a half years after the process was first experimented with. During this time I did not hear or know of anything to show that the process was ineffective. Had prepared clothing constantly under my eyes during the whole period. It is water-repellent.

Q. by B. Is there any "stickiness" to the clothing after being submitted to the process?

A. I have never discovered any.

Q. by B. Could you tell if a moth-eaten garment had been injured before or after being submitted to the process?

A. I think not.

Q. by B. Have Cowles & Co. ever returned goods to the arsenal marked "moth-eaten," to designate that they were moth-eaten before having been sent to them?

A. I saw one piece of cloth marked "damaged," and found it was moth-eaten in two places.

Q. by B. As an expert, do you think the ordinary dust which would fall upon goods exposed for several months unbaled and lying loosely around would injure it by the granulated dust cutting the fiber?

A. I do.

Q. by B. Do you think the dust so falling would attract moths?

A. I do.

Q. by B. Do you think that moths at work on this foreign matter might be taken by inexperienced persons as being at work on the cloth itself?

A. I do.

Q. by B. Do you consider that the process of refinishing cloth by heat and pressure would leave it liable to spot by rain?

A. It would, unless sponged afterwards.

Q. by B. If, in this process of refinishing, the direct fire-heat and pressure are sufficiently great to reduce the thickness of cloth one-half, would it injure its strength?

A. I think it would, because there is no way of regulating the fire-heat. It might be scorched without being perceived.

(A pair of trousers was here shown to the witness.)

Q. by B. Do you think that the work of moths on these trousers was done before or after manufacture?

A. I think after.

Q. by B. Do you see any traces of a moth, such as cocoon or other deposit, on these trousers?

A. I do; traces of moths, but no cocoon.

Q. by B. Do you think the process would have washed away these traces other than the ravages?

A. I do.

Q. by B. Do you think the white spot on these trousers might not have been deposited there since the process?

* See p. 35 for these reports.

A. I think it might.

Q. by B. Can you tell whether these trousers have been subjected to the process of Cowles & Co.?

A. No, sir.

Q. by B. From your knowledge of the manner in which business is transacted at the arsenal, do you think it possible that goods might be marked as having been made from cloth prepared by Cowles & Co., which was not so prepared?

A. I think it possible.

(A bundle of overcoats was here presented to the board by Captain Alligood.)

Q. by B. In your opinion do the cocoons or debris here visible on these overcoats come out of the moth-eaten places thereon?

A. I think they do.

Q. by B. Would the process of Cowles & Co. have washed this debris off?

A. I think it would.*

Q. by B. Could the present appearance have been given to the garment by any means since its preparation?

A. I think it could.

On motion, the board adjourned at 3.30 p. m., to meet to-morrow, the 20th instant at 10 o'clock a. m.

SCHUYLKILL ARSENAL,
Friday, December 20, 1872—10 o'clock a. m.

The board met pursuant to adjournment. Present: Colonel R. B. Marcy, Inspector-General; Colonel Rufus Ingalls, Assistant Quartermaster-General; Captain J. G. C. Lee, assistant quartermaster.

FRANK S. JOHNSTON was then called as a witness and duly sworn.

Question by the board. State your name and position in the military service.

Answer. Frank S. Johnston, chief inspector of clothing, Schuylkill arsenal, Philadelphia, Pennsylvania.

Q. by B. How long have you held this position?

A. Since the 1st of February last.

Q. by B. Are you familiar with the clothing at this arsenal that has been subjected to the process of Cowles & Co., for the purpose of rendering it moth and mildew proof and water-repellent?

A. Yes, sir.

Q. by B. Have you experimented with any clothing submitted to their process?

A. I have.

Q. by B. State the nature and result of such experiments.

A. I experimented with the kersey by cutting large pieces of it, and forming it in a bag and filling it with water. I tried it for ten days, and it never showed any signs of leaking. Then I caused a pair of their prepared trousers to be washed, as a report had come that they emitted a bad smell, after they were worn some time, from the effects of the preparation; also, at the same time, a pair of unprepared, and in my judgment the unprepared emitted a worse smell than the prepared. This was also the opinion of others I called in. I caused to be packed up some of the prepared clothing, together with some of the worst moth-eaten Connecticut blankets I ever saw, I think, in April, this year, but do not know the exact date; and on opening them about two months ago—I think in September—I found no trace of moths on the goods so packed away. I also called on the master-packer to show me, and open in my presence, two bales of clothing that had been submitted to this process, and marked, he said, a year ago, and stowed away; and on a careful examination I found no traces of moths.

Q. by B. Do you inspect or superintend the inspection of all clothing given out of the arsenal to Cowles & Co. as well as others, and all received back?

A. I do.

Q. by B. Do you think it probable, or even possible, that in giving out such clothing some garments may have been included that were already moth-eaten?

A. I don't only think it, but I know it, unfortunately; for the reason that a great many of those coats are and were badly moth-eaten before I came here, hardly any being exempt from it, and in giving my directions to the assistants that I had, and knowing the coats to be so moth-eaten, I directed them to choose the best, in their judgment, and not to send any that were badly eaten. My reasons were, that some were so slightly eaten that it would do them no harm, and that it would save money to the Government by not throwing them aside.

* See his correction of these statements, p. 15.

Q. by B. Is your report of October 4, 1872, to Captain C. A. Alligood, M. S. K., U. S. A., correct?*

A. No, sir.

Q. by B. State in what particulars.

A. I wish to correct the statement that I found moths at work on the trousers. I should have stated that I found live moths, but cannot say they were at work, and that I did not find a great many moths in the overcoats, but that I found many coats moth-eaten and a few moths, one of which I knew to be alive. I do not know whether the remainder were alive or not.

Q. by B. Can you tell by examining the articles whether damage by moths has been done before or after the process of Cowles & Co.?

A. I have never made any observation on this point. I do not think so. In either case the moth-trace would be the same, I think.

Q. by B. In your judgment, were the garments you examined in the arsenal, by direction of the military store-keeper, and found unfit for issue, rendered so by the action of moths subsequent to their having been prepared by Cowles & Co.

A. No, sir; I do not think they were.

Q. by B. Why do you think the damage by moths was not done after the garments had been prepared by Cowles & Co.?

A. Because I have great faith in the preparation, and so many coats were badly moth-eaten before they were sent to them; and in fact there are very few coats in the arsenal that I would like to say are free from some action of moths.

Q. by B. Do you think that the trousers now before the board could have passed through the various hands if the material was moth-eaten before being made up?

A. They could. My reasons for so stating are these: that while I was an assistant inspector at this arsenal, during the war, a portion of the time, pantaloons were brought to me to inspect that had passed through the hands of the cutters and cloth examiners with imperfections in them to which these are mere shadows. Some of these trousers, nearly all, are from the firm of Rockhill & Wilson, to whom they were given by contract previous to my coming here.

Q. by B. Have you certain means of knowing that the trousers exhibited, or the material thereof, have been subjected to the process of Cowles & Co.?

A. No, sir; I do not know whether the cloth from which they have been made had been prepared by Cowles & Co.

Q. by B. Who inspected these trousers when they were received at this depot?

A. I do not know.

Q. by B. Have you any means of determining how long these trousers were in the hands of persons outside the arsenal?

A. No, sir.

Q. by B. Is it probable that any of your assistants would have passed these trousers without having seen the moth-holes?

A. Very; for the reason they have passed things much more glaring.

Q. by B. Do you know of any unprepared garments having passed the assistant or deputy inspectors, which you afterward discovered to have large holes in them? If so, state the instances.

A. Yes; I have known glaring cases of it.

Q. by B. Do you know of any garments prepared by the process of Cowles & Co. which have been in actual use; and, if so, what is their condition?

A. I know of the great-coats that were given out to the watchmen, and examined them in my room carefully, and found them to be in good condition, and not to have lost color at all, no more than any other garment.

Q. by B. How do you account for the fact that recently-prepared goods exhibited traces of moth, while other garments, prepared previously and exposed much longer, are undamaged?

A. I don't know how to account for that. It may be that some portion of the clothing was not prepared as well.

Q. by B. Could it be accounted for by the fact which you have already stated, that the goods were so damaged before having been subjected to the process?

A. Yes.

Q. by B. Have you tested the strength of the prepared goods, as compared with unprepared goods of the same quality; and, if so, with what result?

A. I have, in presence of Captain Rodgers, and I was astonished to find that the prepared goods withstood much more than the unprepared.†

Q. by B. Were you ordered to visit Cowles & Co.'s factory to examine certain coats and kersey, which they alleged were sent them in a moth-eaten condition?

A. Yes.

* See this report, p. 20. Mr. Johnston informed the board that he did not write the report in question, but signed it; and afterward discovered that it incorrectly stated the facts in the manner he pointed out.—G. A. C. & Co.

† Tested by the official machine.

Q. by B. Do you think the garments and kersey were injured before having been sent to Cowles & Co., or since they had left the arsenal?

A. Before.

Q. by B. Are there imperfections in the $\frac{1}{4}$ cloth before being sent to Cowles & Co.?

A. Yes.

Q. by B. What amount of cloth "tare" has usually been allowed to the cutters to cover these imperfections?

A. An eighth of a yard to each imperfection to outside cutters, but nothing to cutters inside the arsenal on prepared goods. The allowance is made to all on unprepared goods. The cloth is tagged or marked, to indicate imperfections, before being sent to Cowles & Co. The outside cutters claim the tare afterward, the same as on unprepared goods; but in the arsenal it has been found that the process has the effect of closing up all little holes, so that the cloth is cut without loss, making an average of about ten per cent. difference.

Q. by B. Is it possible that unprepared cloth might be given out through inadvertence, or any other cause, and made up as prepared cloth?

Q. Yes, very possible.

Q. by B. What is the effect of the refinishing process of Brantley & Leach upon the prepared goods; does it, in your opinion, add to the appearance, strength, or durability of the goods so refinished; do you consider it necessary?

A. The great heat of the irons applied would, I think, in a measure, impair the qualities given by Cowles & Co.'s process. While it would improve the appearance of the cloth, it would detract from its durability. I do not regard it as necessary. It would cause it to spot by rain or water falling on it.

Q. by B. Would or would not the necessary pressing the garments by tailors' irons have a tendency to render the Cowles process futile?

A. No, sir. It would not undergo the same process or the same heat.

Q. by B. Does the process render clothing or fabrics any more liable to spot or become discolored by use?

A. It does not; rather the contrary.

Q. by B. Does the preparation lose its properties by time?

A. As far as my observation goes, it does not.

Q. by B. From your knowledge and observation, do you think the process a preventive in any degree from the ravages of moths?

A. I do most assuredly.

Q. by B. Have unprepared goods been switched and shaken in the same room where unbaled prepared clothing was lying loosely about?

A. Yes, and the floss from the unprepared garments would thus fall on the prepared ones.

Q. by B. Would this fluff, or dust, furnish food for moths, which might be afterwards found on prepared goods?

A. Yes.

Q. by B. To what extent have you observed this fluff on clothing and in the rooms?

A. So that I could pick it up with my finger and thumb. I could scrape it up readily with my hand.

Q. by B. Has your opinion in regard to the process been uniformly as expressed to-day?

A. It has always been the same.

THOMAS S. REESE was then called as a witness and duly sworn.

Question by the board. What is your name and position?

Answer. My name is Thomas S. Reese, and I am chief clerk to Colonel L. C. Easton, Assistant Quartermaster-General.

Q. by B. If you have not already, will you please look over the printed statement on page 18 of the pamphlet before you, and state whether it is, as far as your recollection of the facts goes, a correct *résumé* of the evidence elicited in the examination which it details?*

A. I have read this report, and I have also seen the original report in manuscript of which this purports to be a copy, which I read the day after the investigation, and which gives a fair statement of what occurred during the investigation. I wish further to state that, in making the statement I have just made, I do not wish to be considered as assenting to any deductions or inferences drawn by Messrs. Cowles & Co. unfavorable to Captain Alligood's view of the case.

The board then, at 3 p. m., adjourned until Monday morning, the 23d instant, at half past 10 o'clock a. m.

* This was a communication from Cowles & Co. to General Easton, giving a *résumé* of the evidence taken by that officer in presence of Mr. Reese, dated November 5, 1872, headed "Official examination at the arsenal," and will be found at p. 24.

SCHUYLKILL ARSENAL, PHILADELPHIA, PA.,

Monday, December 23, 1872—10.30 a. m.

The board met pursuant to adjournment. Present: Colonel R. B. Marcy, Inspector General; Colonel Rufus Ingalls, Assistant Quartermaster-General; Captain J. G. C. Lee, assistant quartermaster.

The board then proceeded to make a careful examination of the prepared clothing at the arsenal.

Captain C. A. ALLIGOOD, military store-keeper, was then recalled.

Question by the board. State to the board any further circumstances that may have come to your knowledge since your previous examination.

Answer. I have since discovered more moth-eaten goods that I desire to present to the board, on which evidences of the moths and the moths themselves have been found apparently at work. [The witness here presented five bundles of overcoats, of five each, twenty five in all; also four pairs of trousers, some of which had before been shown, and all were carefully examined by the board.] I think the process of Cowles & Co. would have washed away the evidence of moths on one pair of trousers.

Q. by B. Are you prepared to state positively that the trousers you have shown were made from cloth subjected to the process of Cowles & Co.?

A. I am prepared to state that they are so marked. The marks indicate it, and they are put on in the regular routine of business, and I believe them to be correct. I do not personally examine the material and clothing that go out and come in this place; nor do I go to Cowles & Co.'s factory to see that they prepare all the goods delivered to them.

Q. by B. Where and by whom is the stamp put on the garments made at arsenal?

A. In the packing-room, and by the gang under charge of Mr. Preston.

Q. by B. Is any precaution taken to guard this stamp from improper use?

A. Not that I know of. No unusual care is taken of it.

Q. by B. Do you think it probable that in some instances the tailors who make up the garments outside the arsenal might have changed the prepared cloth put into their hands for unprepared cloth, which they purchased at low rates?

A. I hardly think it possible. I think it not probable.

Colonel LANGDON C. EASTON, Assistant Quartermaster-General, was then called as a witness and duly sworn.

Question by the board. Were the trousers upon which, as stated in your report to the Quartermaster-General, you found moth-eaten traces, after the garments were prepared by Cowles & Co., stamped in the same manner as those now shown to you?

Answer. I do not know anything personally. All I know is the reports that were made to me from time to time from the arsenal, that all material from which pants are made is prepared by Cowles & Co. before the garments are made. The pants which I referred to in my report bore the stamp of Cowles & Co.'s preparation, but were stamped at the arsenal, like those now shown me. I was under the impression at the time I made my report of November 22d that all garments were stamped by Cowles & Co., but since that time I have learned that the pants are stamped at the arsenal.

Q. by B. What was the appearance of the moth you saw at work upon one pair of those trousers?

A. The moth that I saw was a live moth, on the immediate edge of a hole about the size of a small pea, and there were little specks about the moth and hole, which convinced me that the moth had made the hole. The moth was a worm with no covering.

Q. by B. What evidence was there that the moth was at work?

A. No evidence except that which I have already stated.

Q. by B. Should you discover moth-ravages upon clothing that had been treated by Cowles & Co., do you know of any way to determine whether the damage had been done before or after the treatment, provided no moths were found at work upon the clothing?

A. I do not know of any.

Q. by B. What induced you to believe that the moth-traces you saw upon the other trousers reported were made after they had been subjected to the company's process?

A. Mr. Cowles took me all through his establishment, and explained to me fully the process of preparing goods. The pants I refer to—three pairs—were eaten round and along a twine string. I do not think, from his explanation to me, that that string could have been on when they were prepared. I inferred from that, that the clothing was eaten after it was prepared.

Q. by B. Did the Quartermaster-General forward you, for examination, a communication signed by Messrs. George A. Cowles & Co., and dated October 19, 1872?

A. I don't recollect the date of it. He forwarded me a communication of Cowles & Co. with his instructions to make a personal investigation of the question.

Q. by B. In that communication the following statement occurs: "With regard to the fifteen pairs of trousers, which it is alleged have been found moth-eaten, we think it possible some of them have been attacked by moth; and we can only account for it by supposing that they must have been imperfectly saturated in some spots with the fluid preparation, and that the moths, which infest the rooms in the arsenal, where the woolen goods are kept, may have discovered these weak spots. We have said it is possible that a few garments, some half a dozen or so, may have been injured by moth; and that this could be accounted for upon the theory of some spots having been imperfectly saturated. Employing, as we do, a large number of workmen, unskilled as well as skilled, it presents a remarkable evidence of the faithfulness with which they have discharged their duty, when so trifling a percentage is found of incomplete work. It may have been no fault of the workmen, but from causes which it is impossible to guard against even with the utmost vigilance. It is no easy matter to soak goods so that every thread and fiber shall be thoroughly impregnated. We leave the goods for hours in the solution, and have them thoroughly kneaded in the fluid. After this they are partially dried by machinery, which makes no less than 900 revolutions a minute, and it is possible the fluid may in some instances be thrown off the cloth. How very slight must be this danger may be judged from the fact that so trifling a number of garments are even charged with being imperfect." In your report to the Quartermaster-General of the 22d of November, 1872, you say: "But I see no reason why, if it (the process) perfectly protects a part of the garments, it should not protect all." Please explain if by this you mean to be understood as denying the theory advanced by Messrs. Cowles & Co., as to the possibility of imperfect saturation; and, if so, state your reasons therefor.

A. From my knowledge of the process of Cowles & Co., as exhibited to me by Mr. Cowles himself, I don't believe there is any portion of the garment imperfectly saturated, unless by neglect. Believing that all the goods are perfectly saturated by the process, I believe the grounds taken by Cowles & Co. in that report do not hold good.

Q. by B. In your communication to the Quartermaster-General of the said 22d November, 1872, you state, with reference to a protest you say you received from Messrs. Cowles & Co. against permitting cloth prepared by them to be subjected to the process of refinishing as is done by Messrs. Brantley & Leach, "from what I know of this mode of refinishing, I do not see how it can impair the moth-repellent properties of goods prepared by Messrs. Cowles & Co." Will you please state if by this you desire to be understood as declaring that the action of direct fire-heat cannot injure the chemical results of Messrs. Cowles & Co.'s process; and also state what the chemical re-agents used by Cowles & Co. consist of, and your reasons for the conclusions you arrive at that these re-agents cannot be thus impaired.

A. I can only give my opinion, which I did in my report. From the process of Brantley & Leach, as explained to me by them, I don't think any cloth is subjected to sufficient heat to damage the preparation of Cowles & Co. I know nothing of the ingredients of Cowles & Co.'s preparation. I don't think that any of the cloth made up into overcoats or trousers has been subjected to the refinishing process.

FRANK J. ALBRIGHT was then called as a witness and duly sworn.

Question by the board. State your name and position at this arsenal.

Answer. Frank J. Albright. I have charge of issuing supplies here.

Q. by B. Have you ever found live moths on trousers prepared by Cowles & Co.?

A. Yes, sir; three or four.

Q. by B. State what the condition of these moths were; that is, were they naked worms or not?

A. They were naked worms—also in the cocoon.

Q. by B. What was the extent of the ravages?

A. One pair of trousers had a hole through them. The others were eaten tracks, the nap was eaten off; one had a hole in it about the size of a pea, and tracks about it, and there were eggs there.

Q. by B. What is a cocoon?

A. I call a moth-cocoon the furze of the cloth, in which he covers himself and lives.

Q. by B. Does that furze differ from the furze formed on the floor and about the room; and, if so, in what respect?

A. It does not, though I have found white cocoons there. I have also seen blue cocoons on white goods. The cocoons I found on the trousers were the color of the trousers—were blue.

Q. by B. Was the nap eaten off immediately over the cocoon, or was the cocoon immediately over or near the hole. If so, state the exact pair of trousers, and when you saw them?

A. The one that had the hole in it had a naked worm hanging to the hole, and also had cocoons with worms in hanging to it in different places where the trousers were eaten.

Q. by B. Do you positively know of your own knowledge that these trousers had been prepared by Cowles & Co.?

A. They had the stencil on them. It was a red mark, such as those now shown me.

Q. by B. To whom did you give the trousers you have referred to?

A. I called Mr. Barr's attention to them in the first place. He sent for the chief inspector, Mr. Johnston, who examined them.

Q. by B. How many pairs of trousers did you find eaten?

A. I found four that I know Mr. Johnston got, all marked in the same way.

Q. by B. What other prepared garments have you found moth-eaten?

A. In mounted overcoats—these now upon the table.

[The coats shown by Captain Alligood, and examined by the board.]

Q. by B. When did you find them?

A. Yesterday. I was over here, and Captain Alligood asked me to get him the coats.

Q. by B. Where did you get them?

A. In the southwestern wing of the building.

Q. by B. Did you go alone to get the coats?

A. No, sir; I went with the stable boss—no one else.

Q. by B. Have you constant possession of a key to the room?

A. Yes, sir; to all the rooms of the new building. I keep it in my drawer. When I am away, anybody in my department can go and get it, and get out anything they want.

Q. by B. Could not the worms and cocoons and other evidences of moths have been placed on these garments without having originated there?

A. It could be done.

GEORGE W. KESSLER was then called and duly sworn.

Question by the board. What is your name and position in the arsenal?

Answer. George W. Kessler; I am a packer here.

Q. by B. What articles, if any, prepared by Cowles & Co., have you found or seen at this arsenal that were damaged by moth, and to what extent?

A. I have seen them on trousers in getting them out for issue—two live moths. One was a naked worm, and the other in the cocoon. They had eaten the wool off to the thread, and there was a hole in one; I cannot say that they were at work when I saw them; I can't say how extensive the damage was; I saw some on another lot of trousers; I can't say how many. They were eaten all round the string.

Q. by B. Do you positively know of your own knowledge that these trousers had been prepared by Cowles & Co.?

A. No, sir; they bore the stamp of Cowles & Co., such as on those now shown me. [The trousers had the arsenal stamp.]

WILLIAM PRESTON was then called as a witness and duly sworn.

Question by the board. What is your name and position in the arsenal?

Answer. William Preston; master packer.

Q. by B. Have you ever personally made tests of clothing prepared by Cowles & Co.?

A. No, sir.

Q. by B. Have you ever found moth-ravages on clothing prepared by that firm?

A. Yes, sir.

Q. by B. Do you think the ravages were done after being prepared?

A. That would be a hard matter for anybody to answer and stick to the truth. I know of no evidence that would make it clear to my mind without seeing them actually engaged.

Q. by B. Have you ever seen any live moths at work on clothing prepared by them? If so, describe the moth and extent of damage.

A. There was one pair of pants found by the workmen with a moth embedded where a hole was, and which I thought did the damage. I can't say positively, but it looked so to me. The moth was a small worm in a cocoon, and fast to the garment. The hole was small, and the cloth was eaten about the size of the end of my finger. This is all the case I know. I have seen cocoons on overcoats and the linings, principally on the linings, but cannot say they had been at work.

Q. by B. What was the color of the cocoons you saw on the linings of the coats?

A. They were different colors—some blue, some of a lightish color.

Q. by B. Do you positively know that the pants on which you saw the moth had been submitted to Cowles & Co.'s process?

A. No.

Q. by B. Were they stamped like those now shown you? [These were stamped with the arsenal stamp.]

A. Yes, sir.

Q. by B. Is that stamp put on at the arsenal?

A. Yes, sir.

Q. by B. By whom?

A. By persons under my direction.

Q. by B. Is the stamp secured in any way?

A. It lays in the drawer of the table where used. It is not kept locked. It is accessible to between thirty-five and forty men, who are in the habit of being in the room where it is used.

Q. by B. How many prepared coats and garments have been examined, brushed, and baled?

A. I cannot state exactly, but at least forty thousand.

Q. by B. Do you think clothing prepared by this process possesses marked advantage over clothing not prepared?

A. I do. Ravages of moths are usual in unprepared goods; but not so in the prepared goods. On the recent discovery of a moth on the prepared goods, I made the remark that I thought some one was tampering with the acids of the preparation. I have been for five years in my present position, and have been continually handling Government clothing. I think a large amount of clothing has been saved by the preparation, most undoubtedly.

Q. by B. About what percentage or number do you think you have found injured in the prepared goods brushed and baled?

A. It would not be one in a thousand. From the 4th to the 18th of this month 5,775 were brushed and put away. Among these I found 18 that bore traces of moths, of which the inspector only condemned one.

Q. by B. Was there anything to show whether these 18 coats were damaged before or after being prepared?

A. No, sir; nothing that I could see.

Q. by B. How long has the pile of coats the board examined this morning been piled loosely in the arsenal?

A. I think since about the middle of June last.

Q. by B. Do you think it judicious to leave clothing lying loosely about in the arsenal?

A. I do not.

Q. by B. Would not the granulated dust falling on it injure the fiber?

A. It might rub some of them, which might have the appearance of moth-work.

NATHANIEL BARR was then called as a witness and duly sworn.

Question by the board. State your name and position at the arsenal.

Answer. Nathaniel Barr; general receiver, warehouseman, and issuing-clerk.

Q. by B. Have you ever seen moths on goods, cloth, or clothing prepared by Cowles & Co.?

A. I have seen moths, but no ravages of them around the moth.

Q. by B. Do you know that condemned unprepared kersey has been sold from this arsenal to persons in the city?

A. I do.

Q. by B. In what quantities?

A. Large quantities—50,000 yards at one time.

FRANK S. JOHNSTON was then recalled.

Question by the board. Is there any precaution taken to secure the stencil-plate used in the arsenal in stamping goods, or could evil-disposed persons within the arsenal use the plate without liability of detection?

Answer. There is no precaution that I know of. Persons could use it, I think, without detection.

Q. by B. What security is there that outside contractors, who cut and make up trousers, &c., return the same cloth issued to them?

A. None that I know of.

Q. by B. Could outside contractors obtain damaged cloth in the market at reduced prices?

A. If they felt so disposed. I haven't the slightest doubt they could.

Q. by B. How long have you known outside contractors to keep the cloth intrusted to them by the arsenal authorities before returning the clothing ordered?

A. Over ten months.

Q. by B. Were all "blouses" sent to Cowles & Co. for preparation by their process marked by that firm with a stencil-plate? State the size of the plate, and whether, in your opinion, the stamp would be likely to be cut away, so as to leave no trace of it in reducing the size of the blouses, to fit the men by the Army tailors?

A. Those I saw were. The plate is about five inches by four. I don't think the stamp could be so cut away.

The board then, at 4.10 p. m., adjourned, to meet at the Continental Hotel at 10 a. m. to-morrow morning, 24th instant.

CONTINENTAL HOTEL, PHILADELPHIA, PENNSYLVANIA,
Tuesday, December 24, 1872—10 o'clock a. m.

The board met pursuant to adjournment. Present: Colonel R. B. Marcy, Inspector-General; Colonel Rufus Ingalls, Assistant Quartermaster-General; Captain J. G. C. Lee, assistant quartermaster.

NEAL CAMPBELL was then recalled as a witness.

Question by the board. Do you know if kersey, sold by the arsenal authorities, has been purchased at reduced prices in the market by contractors cutting and making up army trousers?

Answer. Yes, sir; I know of that having been done.

Q. by B. If kersey, sold as stated, was sponged and made up by the contractors, could it be distinguished from the kersey given out to them from the arsenal; and if so, how would you distinguish it?

A. I don't think it could be, unless the color were different.

Q. by B. You have said you wished to correct your testimony given before. State what corrections you wish made.

A. I was asked the question if washing a piece of kersey with moth-marks on it would remove the debris. I answered I thought it would; but, after consideration, the goods being only soaked in preparation, I do not think it would remove it.

Q. by B. In your long service at the arsenal, before the preparation of Cowles & Co. came into use, did you find clothing damaged by moths, from time to time? and, if so, state whether in large or limited quantities.

A. I did. I may say that large quantities were damaged.

Q. by B. Can you state the amount of clothing, condemned on account of damage from moths, sold during your service at the arsenal?

A. I cannot tell the amount, but I know there were large quantities of all kinds of woolen clothing.

Q. by B. Do you think the trousers shown you, with the moth-cuts on them, could have passed the cutters, makers, and inspectors, in being manufactured, without the moth-cuts having been discovered?

A. Yes, sir; I feel certain that they could, as one leg was longer than the other, which would have been more easily discovered than the moth-work.

Messrs. Cowles & Co. were here asked if there were any persons they wished examined, or papers they wished to submit to the board; in response to which they stated that they had no witnesses to offer, and submitted a printed pamphlet, which is hereto appended.

The board then proceeded to further examination of the papers submitted by the Quartermaster-General.

Having completed the examination of the case so far as it can be made at this place, and desiring to procure further testimony accessible only at Washington, the board adjourned to meet at that place on Monday, the 30th instant, at 10 o'clock a. m., subject to the approval of the Secretary of War.

WAR DEPARTMENT, WASHINGTON, D. C.,
Monday, December 30, 1872—10 o'clock a. m.

The board met pursuant to adjournment. Present: Colonel R. B. Marcy, Inspector-General; Colonel Rufus Ingalls, Assistant Quartermaster-General; Captain J. G. C. Lee, assistant quartermaster.

The president then submitted the approval of the Secretary of War of the adjournment of the 24th instant.

The recorder submitted a letter from Colonel L. C. Easton, Assistant Quartermaster General, in charge of the Philadelphia depot, dated December 24, 1872, with inclosures.

CHARLES EBERT was then called as a witness and duly sworn.

Question by the board. State your name and the position you occupy.

Answer. Charles Ebert. I am a clerk in the Quartermaster-General's Office, in charge, under General Bingham, of the records and correspondence of the clothing branch.

Q. by B. State what amount of clothing, as shown by the records, has been sold at Schuylkill arsenal, Philadelphia, and Jeffersonville depot, for two or three years past, on account of damage by moths.

A. The information desired is contained in this statement, (paper handed board by witness and appended to proceedings, marked "D,") except 1872, which cannot be definitely ascertained from the reports.

Major J. D. Bingham, in charge of the clothing branch of the Quartermaster-General's Office, submitted, by request of the board, the statement hereto appended, marked F. The board then made up its report and adjourned *sine die*.

R. B. MARCY,
Brevet Major-General, Inspector-General U. S. A., President.
RUFUS INGALLS,
Brevet Major-General, Assistant Quartermaster-General U. S. A.
J. G. C. LEE,
Brevet Lieutenant-Colonel, Assistant Quartermaster U. S. A., Recorder.

D.

Statement showing, as far as can be ascertained from the records of the clothing supply branch, the quantities of moth-eaten woolen garments sold at the depots at Philadelphia and Jeffersonville, in 1869, 1870, and 1871, and the original cost of the same.

1869.

At Jeffersonville:

1,260 yards blue lace.	
849 sack-coats, lined, \$4.80	\$4,075 20
1,494 sack-coats, unlined, \$4	5,976 00
62 uniform jackets, cavalry, \$9.25	573 50
38 uniform jackets, artillery, \$9.25	351 50
136 great-coats, foot, \$12	1,632 00
575 great-coats, mounted, \$14.50	8,337 50
49 pairs trousers, foot, \$4.75	232 75
634 pairs trousers, mounted, \$5.90	3,740 60
254 pairs stockings, 48 cts.	121 92
17,750 wool blankets, \$7	124,250 00
72 sashes, \$2.60	187 20
Total	<u>149,478 17</u>

At Philadelphia:

21,268 blankets, woolen, \$7	\$148,876 00
89 forage-caps, \$1	89 00
50 sack-coats, all kinds, \$4.80	240 00
44,972 uniform coats, all kinds, \$12.50	562,150 00
409 great-coats, mounted, \$14.50	58,130 50
11 great-coats, foot, \$12	132 00
2,146 pairs trousers, foot, \$4.75	10,193 50
82 pairs trousers, mounted.	
92 uniform jackets, \$9.25	483 80
24,376 pairs stockings, 48 cts	11,700 48
Total	<u>791,995 28</u>

1870.

At Jeffersonville:

6,449 woolen blankets, \$7	\$45,143 00
449 forage-caps, \$1	499 00
59 uniform jackets, all kinds, \$9.25	545 75
1,269 uniform coats, all kinds, \$12.50	15,862 50
1,506 great-coats, \$14.50	23,142 00
918 pairs trousers, foot, \$4.75	4,360 50
324 pairs trousers, mounted, \$5.90	1,911 60
13 shirts, flannel, \$2.32	30 16
64 pairs stockings, 48 cts	30 72
450 chevrons.	
Total	<u>91,525 23</u>

At Philadelphia :

1,587	woolen blankets, \$7	\$11,109 00
1,156	uniform coats, all kinds, \$12.50	14,450 00
59	great-coats, mounted, \$14.50	855 50
29	great-coats, foot, \$12	348 00
441	sack-coats, lined, \$4.80	2,116 80
4	sack-coats, unlined, \$4	16 00
211	forage-caps, \$1	211 00
24	corde and tassels, all kinds.	
15,011	uniform jackets, all kinds, \$9.25	138,851 75
1,049	shirts, flannel, \$2.32	2,433 68
145	pairs trousers, mounted, \$5.90	855 50
4,167	pairs trousers, foot, \$4.75	19,793 25
Total		<u>191,040 48</u>

1871.

At Jeffersonville :

254	forage-caps, \$1	\$254 00
127	uniform coats, \$12.50	1,587 50
61	uniform jackets, \$9.25	564 25
300	great-coats, all kinds, \$14.50	4,350 00
924	sack-coats, lined, \$4.80	4,435 20
78	sack-coats, unlined, \$4	312 00
1,888	pairs trousers, foot, \$4.75	8,968 00
1,596	pairs trousers, mounted, \$5.90	9,416 40
2,762	shirts, flannel, \$2.32	6,407 84
1	knit shirt, \$2.25	2 25
11	sashes, \$2.60	28 60
22,092	pairs stockings, 48 cents	10,604 16
500	chevrons, all kinds.	
2,013	blankets, wool, \$7	14,091 00
53	corde and tassels, all kinds.	
Total		<u>61,021 20</u>

At Philadelphia :

3,672	uniform coats, all kinds, \$12.50	\$45,900 00
2,193	pairs trousers, foot, \$4.75	10,416 75
1,139	pairs trousers, mounted, \$5.90	6,720 10
1,300	uniform jackets, all kinds, \$9.25	12,025 00
2,819	flannel shirts, \$2.32	6,540 08
206	great-coats, mounted, \$14.50	2,987 00
4,277	great-coats, foot, \$12	51,324 00
2,959	sack-coats, lined, \$4.80	14,203 20
94	sack-coats, unlined, \$4	376 00
76	artillery caps, \$1	76 00
300,000	pairs stockings, 48 cts	14,400 00
Total		<u>164,968 13</u>

The percentage of moth-eaten stockings cannot be given ; 300,000 were sold in all.

1872.

The proportion of moth-eaten clothing sold at the depots at Philadelphia and Jeffersonville cannot be ascertained from the inspection reports, but it is probably the same as in 1871.

Respectfully submitted.

CHAS. EBERT, *Clerk.*

QUARTERMASTER-GENERAL'S OFFICE, December 30, 1872.

H. Ex. 189—2

RECAPITULATION.

	Jeffersonville.	Philadelphia.	Total.
1869.....	\$149,478 17	\$791,995 28	\$941,473 45
1870.....	91,525 23	191,040 48	282,565 71
1871.....	61,021 20	164,968 13	225,989 33
	<u>302,024 60</u>	<u>1,148,003 89</u>	<u>1,450,028 49</u>

J. G. C. LEE,
A. Q. M., U. S. A., Recorder of the Board.

F.

QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., December 30, 1872.

Statement of woolen clothing and cotton tents (except shelter tents) on hand June 30, 1872, the cost of which is shown in General Orders No. 2, A. G. O., January 7, 1865, except of 42,000 blankets since purchased at \$3 each.

252,121 uniform coats, \$12.50.....	\$3,151,512 50
395,608 uniform jackets, \$9.25.....	3,659,374 00
201,726 uniform trousers, foot, \$4.75.....	958,198 50
87,092 uniform trousers, mounted, \$5.90.....	513,842 80
298,997 flannel sack-coats, lined, \$4.80.....	1,435,185 60
344,492 flannel sack-coats, unlined, \$4.....	1,377,968 00
369,724 flannel shirts, \$2.32.....	857,759 68
215,809 pairs stockings, 48 cents.....	103,588 32
116,217 mounted great-coats, \$14.50.....	1,685,146 50
256,726 great-coats, foot, \$12.....	3,080,712 00
73,648 wool blankets, \$7.....	515,536 00
42,000 wool blankets, \$3.10.....	130,200 00
172,805 yards dark-blue $\frac{1}{4}$ -cloth, \$5.98.....	1,033,373 90
1,242 yards dark-blue $\frac{1}{4}$ -cloth, \$2.09.....	2,595 78
32,691 yards sky-blue kersey $\frac{1}{4}$ -cloth, \$2.35.....	76,823 85
666,016 yards sky-blue kersey $\frac{1}{4}$ -cloth, \$1.09.....	725,957 44
79,312 yards $\frac{1}{4}$ -flannel, \$2.....	158,624 00
1,107,521 yards $\frac{1}{4}$ -flannel, 90 cents.....	996,768 90
5,329 hospital tents, \$175.....	932,575 00
4,815 hospital tents, flies, \$60.....	288 900 00
7,505 wall tents and flies, \$75.....	562,875 00
6,168 wall tents and flies, \$29.....	178,872 00
26,219 common tents, \$38.50.....	1,009,431 50
	<u>23,435,821 27</u>

Official:

J. D. BINGHAM,
Quartermaster, United States Army.

The following extract from a standard work, "Harris's Treatise on Insects," published by direction of the Massachusetts legislature, was presented to the board, as an authority to show the habits of the clothes-moth. It will be seen that as soon as the minute whitish caterpillars, (almost microscopic,) break through their egg-shells, they at once proceed to cover themselves in a case or cocoon, made from the fragments of the stuff they are deposited on, and which cover they retain till they burst forth the following spring as winged moths. This covering or cocoon is not digested and spun by the tiniean caterpillar, but is made of the material on which they are hatched, and it undergoes no change in color or texture; being in a measure similar to the mode in which birds build their nests of straw, &c. Consequently, where it was stated by witnesses, in the foregoing testimony, that cocoons of a blue color were found on the linings of the coats, which are a brownish yellow, it is evident that these cocoons were not made from the material of the linings; but that they were either made from the

foreign "fluff" which the chief inspector declared to be lying around the arsenal from the unprepared clothing, or they were blown or switched from the infected and unprepared clothing, which the evidence shows were brushed, beaten, and cleansed in the same room with the prepared clothing; or else they were placed there by design. It will also be observed that the clothes-moth, in its natural state, never leaves its cocoon until it emerges therefrom as a winged moth. Wherever it is seen as a *naked worm*, it is because it has been disturbed and knocked out of its case, and in these instances it does not feed, but in a few days dies. Wherever, therefore, witnesses speak of having seen naked worms, they merely saw caterpillars which had been switched or brushed out of their cocoons, and which had either by accident or design fallen on the exposed clothing, which was "lying loosely about," as the witnesses state. The evidence is cumulative to show that in the unprepared clothing and blankets, which have been stored in the arsenal, large quantities have been badly infected by moths, and that in the cleansing of this unprepared material, the cocoons in all their stages, and the caterpillars, could readily have been wafted, switched, and blown in all directions; thus fully corroborating our statements to the Quartermaster-General.

G. A. C. & CO.

From Harris's Treatise on Insects.

"The tinieans in the winged state have four short and slender feelers, a thick tuft on the forehead, and very narrow wings, which are deeply fringed. They lay their eggs mostly in the spring, in May and June, and die immediately afterward. The eggs (according to Latrielle and Duponchel, from whose works the following remarks are chiefly extracted) are hatched in fifteen days, and the little whitish caterpillars or moth-worms proceeding therefrom immediately begin to gnaw the substances within their reach, and cover themselves with the fragments, shaping them into little hollow rolls, and lining them with silk. They pass the summer within these rolls, some carrying them about on their backs as they move along, and others fastening them to the substance they are eating; and they enlarge them from time to time by adding portions to the two open extremities, and by gores set into the sides, which they slit open for this purpose. Concealed within their movable cases, or in their lint-covered burrows, they carry on the work of destruction through the summer; but in the autumn they leave off eating, make fast their habitations, and remain at rest and seemingly torpid through the winter. Early in the spring they change to chrysalids within their cases, and in about twenty days afterward are transformed to winged moths, and come forth and fly about in the evening till they have paired, and are ready to lay their eggs. They then contrive to slip through cracks into dark closets, chests, and drawers, under the edges of carpets, in the folds of curtains and garments hanging up, and into various other places, where they immediately lay the foundation for a new colony of destructive moth-worms."

Correspondence which led to the creation of the investigating board.

On the 16th of October last we received a communication from General Meigs, inclosing the following reports, and asking us for a reply. At the same time we were notified that General Easton had taken the responsibility of stopping any more Army clothing and equipage being sent to our factory, pending an investigation.

SCHUYLKILL ARSENAL, PHILADELPHIA, October 5, 1872.

COLONEL: In obedience to your instructions of the 30th ult., based upon a verbal report made by me to you on that date, relative to stores found moth-eaten after being prepared by Messrs. Cowles & Co., I have the honor to state as follows:

The stores referred to were prepared by Cowles & Co.

Of the great-coats received from Cowles & Co., from time to time, since last June, I have examined about five hundred; about one-half of this number presents evidence of moth; that is, they are slightly eaten. Many of them had cocoons on, and that peculiar dross or dust seen on moth-eaten goods.

On some twenty or thirty of the coats the larvæ have been found alive, and apparently at work.

I have two of these coats in the office, on which are the cocoons with the moths in the chrysalis state.

Ten of the coats examined have been found damaged to an extent rendering them unfit for issue.

Of about three hundred pairs of trousers prepared by Messrs. Cowles & Co., which had been lying loosely and exposed in an upper room of one of the store-houses for two months past, fifteen were condemned by the inspector as unfit for issue, on account of being moth-eaten. Two pairs of these trousers are badly moth-eaten.

In the same room with these trousers there were about two hundred and thirty-seven (237) garments of different kinds, which had been prepared previously by Messrs. Cowles & Co., and were exposed longer than the above-mentioned trousers, yet no evidence of moths could be found on them.

I am still examining the garments received from Messrs. Cowles & Co., of which several thousands are lying loosely in the store-houses, waiting opportunities to be baled. They are received much faster than they can be baled, owing to the paucity of facilities for baling such large quantities. I will report the result of this examination from time to time.

I inclose herewith the report of Inspector Johnston on this subject.

Very respectfully, your obedient servant,

C. A. ALLIGOOD,

Captain and Military Storekeeper, U. S. A.

Colonel L. C. EASTON, *Assistant Quartermaster-General, U. S. A., Philadelphia.*

CLOTHING DEPARTMENT, SCHUYLKILL ARSENAL, October 4, 1872.

CAPTAIN: In obedience to your instructions of the 27th ultimo, directing me to make an examination of the clothing treated by Messrs. Cowles & Co., I have the honor to report that I have examined, as far as in my power, the articles so treated, and find traces of moth.

Fifteen pairs of trousers, made some time during the last two months, and left exposed, I found moth-eaten; three pairs in several places, two of which I found the moth at work, and the remainder slightly eaten, but not sufficiently to render them unserviceable.

I have also examined the great-coats, and find a great many in which are living moths. I have examined carefully about 600 of these coats, and, notwithstanding I found the living moths in them, yet I have discovered but two coats eaten by the moths, and they so slightly as to be immaterial. I would also call attention to two bales of sack-coats and trousers, which had been left open, and the goods exposed, during the greater portion of last summer. These articles were in the same room and in close proximity to the fifteen pairs of trousers referred to; and yet, upon closely examining them, I find no traces whatever of moths. I have also examined the kersey and coat-cloth treated by Messrs. Cowles & Co.; and while I have been unable to find traces of moths, yet I am of the opinion that some of this material is slightly moth-eaten, which will account possibly for some of the slight traces of moths in the twelve pairs of trousers before referred to. I am led to express my opinion in relation to the kersey, for the reason that it is not examined yard by yard, but as to texture and shade. It is a reasonable supposition that some of this kersey has been slightly moth-eaten, because so many trousers have been condemned and sold on that account. While I do not assert that the kersey was moth-eaten when the fifteen pairs of trousers were made, yet I deem it due to Messrs. Cowles & Co. to give them the benefit of the doubt which exists in my mind. As before remarked, I have not examined all the garments for want of time, and make this report without giving the quantities examined, in order that you may be informed as to the progress so far made, as I know your anxiety upon the subject.

Very respectfully, your obedient servant,

FRANK S. JOHNSTON,

Chief Inspector.

Captain C. A. ALLIGOOD, *Military Store-keeper, U. S. A.*

After having fully investigated the matter, so far as it was in our power, we addressed the following communication to General Meigs, on the 19th of October, handing it to him in person:

217 LEVANT STREET,
Philadelphia, October 19, 1872.

SIR: We have the honor to acknowledge the receipt of your communication, dated the 15th instant, calling our attention to a report which you inclose from the military store-keeper at the Schuykill arsenal, as to certain articles of clothing treated by our process, and referring it to us for remarks thereon.

We have read the report carefully, and have visited the arsenal, and made such examination of the goods spoken of as it was in our power to do, and we think the result justifies us in emphatically stating that the report was made under a misconception of the facts, and a want of information as to important matters affecting them.

So far from the facts bearing against the merits of our process, we feel satisfied that a proper examination of the whole case will demonstrate the extraordinary success of the process and the vast saving to the public property which its application has insured.

The report of the store-keeper alleges that certain great-coats, and some other articles of clothing, were "found moth-eaten *after* being prepared by Messrs. Cowles & Co," and proceeds to make an enumeration thereof, which sums up by stating that a large number of overcoats present evidence of having been eaten by moths; that on "some twenty or thirty of the coats the larvæ have been found alive and apparently at work," and that fifteen pairs of trousers have been condemned by the inspector.

These goods, it is stated, were lying "loosely" and exposed in an upper room, and it is further stated, as an extraordinary fact, that in the same room with these trousers "there were about two hundred and thirty-seven garments of different kinds, which had been prepared previously by Messrs. Cowles & Co., and were exposed longer than the above-mentioned trousers, yet no evidence of moth could be found on them."

Whilst the language of the report seems to distinctly state that the coats were moth-eaten *after* they had been prepared by us, the store-keeper, in an interview we had with him yesterday, disclaimed any intention of charging that the moths had destroyed the coats after we had prepared them, and not before. He assured us that he intended to express no opinion on that point; and we can only say that in justice to us it was unfortunate his language was not more exact in this respect, for as it stands in his report it appears as if he charges us with preparing the coats, and that after we had prepared them they were attacked and injured by moths. If the store-keeper, who has only been a few months in his present position, had been familiar with the facts and the material connected with the clothing stored in the arsenal, he would have known that a very large proportion of the unprepared clothing and cloth on hand was injured by moth; that we have frequently discovered this damage when the unprepared goods were sent to our factory; and that we had in numerous instances, where we had found the goods to be damaged, returned them to the arsenal marked "moth-eaten." This being the case, had he been aware of it when he found the damaged coats, it would perhaps have occurred to him to first ascertain, with reasonable certainty, whether the garments had been properly inspected before they had been sent to us, and if there was any proof to show that the injury by moth had occurred, not "*after*" they had been subjected to our process, but before they had been sent to us.

Upon the matter coming to our knowledge that the store-keeper had reported that some of the stores in the arsenal had been "found moth-eaten after being prepared" by us, we made a critical examination of a lot of coats which had been sent us from the arsenal about four days previously. The lot consisted of 340 great-coats. Of this number we found no less than 98 of the coats moth-eaten, some very badly; and more than one-half of the 98 having holes through the cloth. Here, then, was presumptive evidence, at least, that the coats returned previously to the arsenal, which the store-keeper had afterwards discovered to be moth-eaten, were so before being sent to us, and when in an unprepared state; and this would account for the otherwise extraordinary fact that goods prepared by us, and lying loose in the arsenal for a longer period, exhibited no trace or evidence of moth, as the store-keeper states; while in the same room he found more recently prepared garments with moth-tracks. We do not claim that our process will repair injury already done by moth; and hence, if the goods are sent us already moth-eaten, they will exhibit the holes and tracks previously existing. But we maintain that, if properly saturated, the damage will go no further.

On the 11th instant we called upon the store-keeper, and informing him of the result of our examination of the lot of coats which we had just received from the arsenal, requested that he would visit our factory, and examine the lot himself. He subsequently sent the chief inspector and chief clerk at the arsenal, and they verified our statement as to the number of moth-eaten coats, and that they must have been sent to us from the arsenal in that condition, as they had not been in our possession a sufficient time to have received any injury whatever from moth while in our factory. Up to this time the store-keeper has not reported this matter, as to the condition of the goods sent us from the arsenal, to his superior officer; and we have consequently urgently asked him to do so without further delay.

With regard to the fifteen pairs of trousers which it is alleged have been found moth-eaten, we think it possible some of them have been attacked by moth; and we can only account for it by supposing that they must have been imperfectly saturated in some spot with the fluid preparation, and that the moths which infest the rooms in the arsenal, where the woolen goods are kept, may have discovered these weak spots. But in every instance which the store-keeper showed us the moth worm had died, thus proving that as soon as the minute unprepared spot had been eaten, and the worm had touched the saturated cloth, the preparation killed it.

As for the moths and larvæ said to have been found upon the prepared goods, there is no evidence whatever that they were feeding upon them, with the possible exception above noted, where a spot may have been imperfectly saturated.

The prepared goods, as a rule, have been permitted to lie around the arsenal rooms loose for months; and in the same room with prepared goods unprepared goods are examined, and the moths and larvæ switched out of them falling with the woolen dust on the prepared clothing in the same room and being wafted by the wind to all parts

of the building. The prepared clothing being permitted to lie around loosely and not baled up, the moths ready to lay their eggs deposit them upon the exposed prepared goods or on the floor—anywhere, in fact; and the woolen dust which has been switched and shaken and is deposited by the law of gravitation, forms, no doubt, nourishment for the larvæ wherever it may happen to be. That this is the case is demonstrated by the fact that the moths and larvæ are found in greater numbers on the cotton linings of the exposed prepared goods than upon any other portion of them, and this because the linings are generally uppermost, and consequently receive a larger amount of the woolen dust shaken out of the unprepared goods. It is needless to say that moths do not eat cotton goods, and consequently their being found on the linings is proof that it is this woolen dust which attracts and feeds them. To find larvæ upon the prepared clothing thus exposed is only what might reasonably be expected; while the fact that, notwithstanding this, they do not eat the goods so prepared, proves that, even with this extraordinary test, the clothing is found to be moth-proof.

It is not only that moths are found throughout the arsenal building, because of the large quantity of unprepared goods stored there, but in the cellar of the building there is stored a lot of Connecticut blankets, which General Van Antwerp, the former store-keeper, in a letter to General L. C. Easton, dated July 2, 1872, described as being "*literally alive with moths*," and which the chief inspector informed us yesterday were still there, and in such a condition that, "when shaken, clouds of moths flew out of them."

The windows and doors of this store-house are frequently opened; our prepared goods are suffered to remain in the same building, "lying loosely," for months; unprepared goods are beaten in the same building, and in some instances in the same room; the eggs and larvæ are thus wafted about, together with the woolen dust, and then it is considered extraordinary that larvæ should be found where it has been blown, wafted, and switched. Of all the thousands of garments we have prepared, some 50,000 of them probably lying unbaled at different periods in such an atmosphere, half a dozen or so are found injured; that is, it is alleged the moth has actually been found feeding on them. Our case might well rest here without another word.

We have said it is possible that a few garments, some half a dozen or so, may have been injured by moth, and that this could be accounted for upon the theory of some spots having been imperfectly saturated. Employing as we do a large number of workmen, unskilled as well as skilled, it presents a remarkable evidence of the faithfulness with which they have discharged their duty, when so trifling a percentage is found of incomplete work. It may have been from no fault of the workmen, but from causes which it is impossible to guard against, even with the utmost vigilance. It is no easy matter to soak goods so that every thread and fiber shall be thoroughly impregnated. We leave the goods for hours in the solution, and have them thoroughly kneaded in the fluid. After this they are partially dried by machinery, which makes no less than nine hundred revolutions a minute, and it is possible the fluid may in some instances be thrown off the cloth. How very slight must be this danger may be judged from the fact that so trifling a number of garments are even charged with being imperfect.

In view of the importance of the matter to the Government, and in justice to ourselves, we beg, most respectfully, to ask that a board may be appointed to examine into the facts, and that this board may be composed of the highest officers unconnected with the arsenal, and who will thus have the question before them without bias of any kind from any previous knowledge of the process and its results.

With the highest respect, your obedient servants,

GEO. A. COWLES & CO.

Major-General M. C. MEIGS,

Quartermaster-General, Washington, D. C.

General Meigs informed us that perhaps we might not require a board, and that he would, in order to gather all the facts, refer our statement above given to General Easton, of Philadelphia. We accordingly placed ourselves in communication with General Easton, to whom we officially addressed the correspondence which follows:

217 LEVANT STREET, Philadelphia, October 30, 1872.

SIR: On looking over our letter of the 19th instant to the Quartermaster-General, in reply to his reference of the 15th instant, we find we omitted a statement in connection therewith, which we now make, with the request that it may be considered as a portion of our communication of the 19th.

We desire to state, in any case where it may be shown that goods have become damaged by moth after having been subjected to our process, (which may be the case in the event of imperfect impregnation,) that we will, in all such cases, make a rebate. At the same time we repeat what we stated in our previous communication upon this subject, that even if any goods have been thus damaged, the number is extremely inconsider-

able. And we also beg to say, that we shall take, if possible, greater precautions in future to secure perfect impregnation in every instance, now that we are made aware of the danger.

As it is not charged our process induces moth, and as we are willing to pay a rebate on any goods where our process has been imperfectly applied, and injury by moth has been the result of such imperfection, we, in fact, place ourselves in the position of insurers, so that the Government will only pay for moth-proof work, and therefore runs no risk whatever. We take this occasion to inclose certain affidavits bearing upon the facts submitted in our communication to the Quartermaster-General above referred to.

We have the honor to be your obedient servants,

GEO. A. COWLES & CO.

General L. C. EASTON,

Deputy Quartermaster-General, U. S. A., Philadelphia.

STATE OF PENNSYLVANIA,

City and County of Philadelphia, ss :

On the thirtieth day of October, A. D. 1872, personally appeared George A. Cowles, of the firm of George A. Cowles & Co., of said city, who, being duly sworn according to law, deposes and says, that having been informed that the store-keeper at the Schuylkill arsenal had reported that several of the coats at the arsenal which had been prepared by the preservative process of the said firm presented evidence of injury by moth, he proceeded to the factory of the firm on the sixth day of October instant, and gave directions to the superintendent and foreman employed there to make a personal and critical examination of the garments which might be on hand, and which had been sent to the factory from the Schuylkill arsenal for the purpose of being subjected to the process aforesaid; that the deponent also personally examined the said garments himself, and found a large number of them badly injured by moth; and that deponent positively and emphatically declares and believes, from the short time said coats were in their possession, that they were moth-eaten when sent from the arsenal, as aforesaid, to deponent's factory.

GEO. A. COWLES.

Sworn and subscribed before me this thirtieth day of October, A. D. 1872, as witness my hand and notarial seal.

[L. S.]

ALEX. THACKARA,

Notary Public.

STATE OF PENNSYLVANIA,

City and County of Philadelphia, ss :

On this twenty-ninth day of October, A. D. 1872, personally appeared Nelson H. S. Hays, superintendent for the firm of George A. Cowles & Co., of said city, Victor Vierow, William B. Lilly, L. T. Jackson, and J. Collins, foremen for said firm, who, being severally sworn according to law, depose and say that on the seventh day of October, A. D. 1872, according to directions given them by George A. Cowles, of said firm, they commenced an examination of three hundred and fourteen great-coats, mounted, which were delivered to said firm from the Schuylkill arsenal on or about the twenty-seventh day of September preceding, and were prepared by them by the patent chemical process of said firm within five days thereafter, namely, on the second day of October, A. D. 1872; that out of said lot of coats they found one hundred and twenty-six (126) more or less moth-eaten, some of them very badly; that said coats were coats not selected, but were all which happened to be on hand when they made the examination for moths; and further, they severally declare that they have severally and frequently discovered and observed moth-eaten tracks and holes in clothing and material sent from the arsenal before it was prepared by the process of the firm; and that each of deponents hereto is satisfied that the lot of great-coats aforesaid were moth-eaten, as the examination clearly showed, before they were sent from the arsenal to the factory of the firm.

NELSON S. HAYS.

VICTOR VIEROW.

WM. B. LILLY.

LEWIS T. JACKSON.

JAMES COLLINS.

Severally sworn and subscribed before me this twenty-ninth day of October, A. D. 1872, as witness my hand and notarial seal.

[L. S.]

A. N. NORTON,

Notary Public.

OFFICIAL EXAMINATION AT THE ARSENAL.

217 LEVANT STREET, Philadelphia, November 5, 1872.

SIR: Having been permitted to be present yesterday at the arsenal while you were examining into the report of the store-keeper, in his communication to you of the 5th ultimo, with reference to the state of the goods at the arsenal which had been subjected to our process, we beg, with great respect, to submit the following remarks thereon, which we desire to go upon the record in connection with our communication to the Quartermaster-General of the 19th ultimo, upon the same subject, and which was referred to you for examination and verification.

In our communication of the 19th ultimo, while generally admitting many of the facts presented by the store-keeper, we took exception to the looseness of his phraseology, and also to the circumstance that he had not presented *all* the facts. Thus we find the store-keeper, on the 5th ultimo, alleging that he had examined a large number of coats, and declaring that he "found them moth-eaten after being prepared by Messrs. Cowles & Co.;" while upon turning to the chief inspector's report of the day preceding, made to the store-keeper, we find it stated that he, the chief inspector, knew that moth-eaten goods had been sent us to be prepared from the arsenal, and that he deemed it due to us to state it was a reasonable supposition that the coats and other garments which were found moth-eaten had been so injured before they had been sent to our factory for treatment by our process; and that he was strengthened in this view of the case by the fact that "two bales of sack-coats and trousers, (prepared by Cowles & Co.,) which had been left open and the goods exposed during the greater part of last summer, were in the same room and in close proximity to the fifteen pairs of trousers, (which exhibited traces of moth,) and yet, upon closely examining them, I find no traces whatever of moths." The chief inspector naturally inferred that when he was aware damaged goods had frequently been sent us, and when he found undamaged goods, prepared by our process, remaining sound and untouched, notwithstanding this great exposure, that it could only be accounted for by the fact that our process was a moth-preventive, and that the injured goods were so injured before they were treated by us. The store-keeper's report makes no mention of the circumstance that injured goods had been sent us, although the chief inspector had reported the fact to him in writing the day previous to the date of his (the store-keeper's) report to you.

In the examination yesterday all the statements in our communication of the 19th ultimo were not only fully corroborated, but some additional facts were developed, which makes our case even stronger than we had presented it. The chief inspector, when examined, stated that, having visited our factory by direction of the store-keeper, and having seen the large number of moth-eaten coats there, which had undoubtedly been sent to us in that condition from the arsenal, many of them in a worse condition than any of the coats which had been found thus far returned by us to the arsenal, he had no hesitation in expressing his conviction that the coats at the arsenal which had been subjected to our process, and exhibited injury by moth, were so injured before they were sent to us. He also stated that he had only seen *four* moths altogether upon the prepared goods at the arsenal, and that these moths were not eating the goods, nor were the coats upon which he saw the moths injured. He further said that he knew of garments passing the deputy inspectors which it was afterwards discovered had large holes in them; so that no inference could be drawn unfavorable to us from the supposition that the damage was too great to escape the observation of the men who inspected the goods sent us.

The store-keeper, in his report to you of the 5th ultimo, alleges that "on some *twenty or thirty* of the coats the larvæ have been found alive and apparently at work." The chief inspector, the day before, reported that he had discovered but *two* coats eaten by moths; and on yesterday he stated that he had only seen *four* moths altogether. The store-keeper, who depended upon the chief inspector's report, alleges there were "*twenty or thirty*."

Two of the gang of workmen employed in brushing and baling the prepared goods, and who have thus brushed and baled thousands of prepared garments, were produced yesterday by the store-keeper to prove that live moths were found "on twenty or thirty coats." To an inquiry from you as to whether they had observed moths on the prepared goods, they answered, "Yes, plenty of them." Upon, however, being pressed by us for a more definite statement, and after much hesitation, one of the men said he had only himself seen *three* moths, whilst the other man had only seen *one* moth. Upon being further questioned as to whether they had not "heard" that some more moths had been seen by the gang of workmen, one of the men declared that he had "heard" that *thirteen* moths in all had been seen; while the other man (they were examined separately) had only "heard" of *ten*. So that the "plenty of moths," when examined into, became three absolutely seen by one of the men, one of the three absolutely seen by the other man, and a tradition that thirteen had been seen in all!

While we did not deny, in our communication of the 19th ultimo, that it was possible

some of the prepared cloth may have been, in consequence of hasty manipulation, imperfectly impregnated by our process, and that the moths, finding the weak spot, attacked it, we were not prepared to learn, as we did yesterday, that this injury could only be directly traced to *one* pair of trousers, and inferentially to two other pairs. In one pair of trousers a live moth was said to have been found at work. When exhibited to us it was dead, having doubtless nibbled beyond the imperfect spot and been destroyed by the prepared portion. The very fact that this one moth had effected a lodgment in a single pair of trousers, not, it was said by the store-keeper in his report, so much exposed as "two hundred and thirty-seven garments of different kinds which had been prepared previously and which were unharmed," is proof to any reasonable and fair mind that our process, perfectly applied, is an absolute safeguard against moth; and the imperfection of impregnation, extending at most to *three* garments, also proves how very little danger there is from that cause. For in all the fifty thousand garments subjected to our process, and about one-half of which have been brushed and baled by the laborers of the arsenal, but *three garments* are shown which there is any fair and honest proof have suffered injury since they were treated by us.

That moth-worms may have been found on our prepared goods we do not deny, but we account for it by showing that the unprepared goods are frequently inspected in the same room with the prepared goods, and that the "dross," and perhaps larvæ, are wafted and blown on our goods, and that the moth-worm may be feeding upon this foreign substance, so wafted and blown. This the chief inspector, the only expert examined, declared might well be the case, and he also acknowledged that our statement was true, that unprepared goods were examined in the same room with prepared goods, and that they were there shaken and tossed about; that he had seen the dross or fluff from the unprepared goods floating about and settling on the prepared goods, upon which it lay in sufficient quantities to be taken up by the thumb and fingers; and that when he saw the moths on the prepared goods *he could discover no injury they were doing to those goods*, and thought it quite probable they were in reality feeding on the unprepared dross or floss which had floated upon them.

As for our assertion that the prepared goods have been suffered to lie around the rooms of the arsenal for months unbaled, we offer a striking proof in the case of the very pair of trousers upon which the live moth was said to have been found. Upon examining the trousers in question, the chief inspector declared he had not cut them. The store-keeper's clerk stated that they were cut previous to March last, and had been then sent to outside contractors to be made, and that they had remained in the hands of these contractors for several months. How long previous to last March the prepared cloth had been in the arsenal could not be ascertained. But the fact remains, that these trousers were never baled up, but for months had been permitted to lie around in the workshop of parties outside the arsenal, or in the arsenal itself. The store-keeper, in answer to an inquiry by you, excused the remissness in baling and using reasonable care in securing the prepared goods from lying loosely around where the dross or fluff and larvæ from the unprepared goods would fall upon them, by saying that as they were prepared goods he did not consider it necessary to take the same care of them that he would bestow upon unprepared goods. We cannot say what treatment these trousers were subjected to in the several months during which they were in a private workshop, out of the custody of the keeper of the arsenal.

The store-keeper acknowledged that of the moths seen on the prepared coats by far the larger number were found on the cotton linings of the coats. We accounted for this in our communication of the 19th ultimo by saying that as the coats were folded these linings were uppermost, and that the "dross" or fluff and larvæ from the unprepared goods fell upon the cotton linings thus exposed, and that it was upon this unprepared "dross or dust" the moths were feeding. We observed that it was needless to remark that moths will not feed on cotton, because we took it for granted that that was not an open question to any one in the slightest degree conversant with the habits of the moth-worm. The store-keeper, however, stated yesterday that while it was undoubtedly true that the greater portion of the moths seen on our goods were observed upon the linings of the coats, yet that he had just made what he termed "a remarkable discovery," which proved that not only would moths eat cotton linings, but they seemed to prefer it. This "discovery" was made, it was alleged, in a box of unprepared coats, which were in a shed outside of the arsenal yard, and which were badly eaten by moths. Upon opening the box, we saw at once the mistake the store-keeper had made. The linings of the coats thus badly eaten were made of a shoddy of wool and hair, and it was this old wool and hair stuff the moths "preferred" and had literally riddled. Upon turning the coats over some were found with the ordinary cotton linings, such as nearly all the Army coats which had been sent to us for preparation are lined with; and here it was found, that notwithstanding the coats themselves had been eaten, notwithstanding the "dross and dust" from the woolen fiber had fallen thickly upon these cotton linings, *not a thread or particle of the lining was eaten*.

It was acknowledged by the store-keeper's clerk that he had sent us frequently, both to our Brooklyn factory and here, bundles of coats in their original bales, without

any inspection beyond what had been given them several months previously for a different purpose.

With regard to the Connecticut blankets, the fact was clearly elicited, after much difficulty, from the person in charge of them, that they had been left exposed and uncovered in the cellar of the building where they were stored, with the doors and windows constantly open, with the men attached to the arsenal continually going in and out of the cellar, or, as the witness expressed it, making a "thoroughfare," till "about six weeks ago," when, for the first time since these blankets were in store, they were covered up and the cellar doors kept closed. The "about six weeks ago," mentioned by the person in charge, coincides with the time when this question of moths upon our goods first arose.

The store-keeper states, at the close of his report of the 15th ultimo, that he "is still examining the garments received from Messrs. Cowles & Co.," and that he "will report the result of this examination from time to time." In reply to your inquiry yesterday, he stated that he had no additional facts to report. So that it appears, with the closest examination, he has been unable to gather a single additional unfavorable result; while, as we have proved, the report already made did us an injustice in the equivocal character of its language, and its marked omission of the important facts contained in the chief inspector's report.

In view of all these facts, and the complete vindication of our process which the examination has disclosed, we beg most respectfully to ask that the work may be resumed. The heavy expense we have incurred by the cessation of work at our factory, while we were compelled to retain under pay the skilled labor which we have educated to the business, we cheerfully bear, when the result demonstrates that the judgment of the Quartermaster-General, in recommending our process, is so fully borne out in the rigid examination now made.

Your obedient servants,

GEORGE A. COWLES & CO.

General L. C. EASTON,

Deputy Quartermaster-General, Philadelphia.

CITY AND COUNTY OF PHILADELPHIA,

State of Pennsylvania, ss :

On this 20th day of November, 1872, personally appeared George A. Cowles and George W. Brega, of the firm of George A. Cowles & Company, who, being duly sworn according to law, depose and say that they were present at the examination held by General L. C. Easton, at the Schuylkill arsenal, on the fourth day of November instant, with reference to the result of the process of George A. Cowles & Co. upon certain cloth and clothing, and that the statements as to said examination contained in the communication to the said General L. C. Easton, dated the fifth day of November instant, are fully, correctly, and truly given therein, to the best of their knowledge and belief.

GEO. A. COWLES.
GEO. W. BREGA.

Sworn and subscribed to before me this 20th day of November, A. D. 1872.

[L. S.]

A. N. NORTON,

Notary Public.

The Quartermaster-General, on the 15th November, forwarded us the following additional report from the store-keeper:

SCHUYLKILL ARSENAL,

Philadelphia, October 21, 1872.

COLONEL: In addition to my report of the 5th instant, relative to moths having been found in clothing treated by Messrs. Cowles & Co., I have the honor to present the following:

I have examined about one thousand (1,000) more of the great-coats, of the same lot referred to in my former report, and have found thirteen coats moth-eaten, and about the same number of live moths on them.

In another lot of trousers—seventy (70) pairs—made of material treated by Messrs. Cowles & Co., ten (10) pairs have been found moth-eaten. Three pairs of these trousers were tied together by a hemp string, and it is along the line of this string that the trousers are eaten. A live moth was found under the string. Cocoons, with moths in them, were also found around the string, on the material, and near the moth-eaten parts.

On another pair of the trousers, from the same lot, I found a hole as large as a pea, eaten through one layer of the cloth, and in this hole a live moth. This pair of trousers was folded up with the moth in the hole on the 11th instant, and remained so folded until the 18th, when the trousers were unfolded for examination by Messrs. Cowles & Co., and the moth found dead.

On the 11th instant Mr. Cowles informed me that among the great-coats in his possession, and not yet returned, a large number was moth-eaten, and requested that I call at his place or send some one to examine them. In accordance with this request, I directed the chief inspector and my chief clerk to visit the factory of Messrs. Cowles & Co., and examine the coats.

On the 12th instant the inspector and clerk called at the factory, and examined three hundred and forty (340) coats, ninety-eight of which were moth-eaten. They also found two (2) pieces of kersey moth-eaten.

These coats, Mr. Cowles alleges, were the last delivered to him.

I immediately ordered an examination of seven hundred and fifty (750) great-coats last received from Messrs. Cowles & Co., and which were of the same lot as those last delivered to him, with a view of ascertaining whether or not there was any such proportion moth-eaten among them.

After a careful and thorough examination of these seven hundred and fifty (750) coats, I found six (6) of them moth-eaten.

Very respectfully, your obedient servant,

C. A. ALLIGOOD,
Captain and Military Store-keeper, U. S. A.

Colonel L. C. EASTON,
Assistant Quartermaster-General, U. S. A.

In reply we addressed this letter to General Easton :

217 LEVANT STREET, PHILADELPHIA,
November 16, 1872.

SIR: Since the date of our communication, which we had the honor of addressing you on the 5th instant, we have been furnished with a copy of a report made to you by the store-keeper of Schuylkill arsenal, dated the 21st October, with reference to our prepared goods, and in continuation of his former reports upon the same subject.

The examination had by you at the arsenal on the 4th instant, at which we were permitted to be present, covered all the points advanced by the store-keeper in all his reports; and our communication to you of the 5th instant fully reviewed and answered them. But this last report of the store-keeper's is open to the same objection which we have made to his previous report, namely, that he has *suppressed* important facts bearing upon the merits of the case, and which, whether designedly or otherwise, has the effect of misrepresenting the matter, misleading the Government, and doing us a grave injury. We feel pained at being compelled thus to designate the store-keeper's report; but there is such a persistency of omission running through all the reports he has made, as to force us, in self-defense, and more than that, in vindication of the truth, to make the charge, and endeavor to support it beyond all controversy.

In our communication to the Quartermaster-General of the 19th October, and in our letter to you of the 5th instant, we pointed out the omissions made by the store-keeper in his report of the 5th October. These consisted of the omission to report the fact reported to him by the chief inspector, that coats and cloth had, to his knowledge, frequently been sent us in a moth-eaten state; that the chief inspector had informed him that while he had seen moths upon the prepared goods, yet, upon examining them, he could not discover that they were feeding upon the goods, or doing them any injury. That while the store-keeper reported he had seen "that peculiar dross or dust seen on moth-eaten goods" lying upon our prepared goods, he omitted to state that unprepared goods were shaken and beaten in the same room with prepared goods, and that the "peculiar dross or dust" was thus shaken and beaten from the goods which were unprepared, so as to be blown or wafted on the prepared goods. That the chief inspector had, in writing, expressed his belief from all the facts, including the fact that prepared goods much longer exposed than those upon which moth-tracks were found were discovered to be uninjured, that the goods so found with moth-tracks were injured before they had been sent us from the arsenal. None of these facts were stated by the store-keeper in his report of the 5th ultimo; and yet their mere statement explains at once the whole matter, and shows why it is that, to quote from the storekeeper's report, "in the same room with these trousers, (which it is alleged presented evidence of injury by moth,) there were about two hundred and thirty-seven garments of different kinds which had been prepared previously by Messrs. Cowles & Co., and were exposed longer than the above-mentioned trousers, yet no evidence of moth could be found on them." The chief inspector had already informed him that moth-eaten goods had been sent to us for preparation, and if the store-keeper had but mentioned this fact in his report to you, it would at once have accounted for the goods so recently prepared exhibiting evidence of being moth-eaten, while much longer-prepared goods were sound and untouched.

In the store-keeper's report to you of the 21st October, and which was sent to us from the Quartermaster-General's Office, since the date of our communication to you of the 5th instant, he makes the following statement, in connection with the examination had

by the chief inspector and his chief clerk, as to the moth-eaten goods in our factory and which we informed him at the time were sent to us in the moth-eaten condition they now present. We give the store-keeper's statement in full:

"On the 11th instant Mr. Cowles informed me that among the great-coats in his possession, and not yet returned, a large number was moth-eaten, and requested that I call at his office, or send some one to examine them. In accordance with this request I directed the chief inspector and my chief clerk to visit the factory of Messrs. Cowles & Co. and examine the coats.

"On the 12th instant the inspector and clerk called at the factory and examined three hundred and forty coats, ninety-eight of which were moth-eaten. They also found two pieces of kersey moth-eaten.

"These coats, Mr. Cowles alleges, were the last delivered to him.

"I immediately ordered an examination of seven hundred and fifty great-coats, last received from Messrs. Cowles & Company, and which were of the same lot as those last delivered to him, with a view of ascertaining whether or not there was any such proportion moth-eaten among them.

"After a careful and thorough examination of these seven hundred and fifty coats, I found six moth-eaten."

These facts, when *all* stated, are as follows: We requested the store-keeper to come to our factory and examine these coats and kersey, stating to him that they were badly moth-eaten, and that they were the last lot which had been sent to us from the arsenal. This request was made on the 11th of October, the coats and kersey having been sent to our factory from the arsenal on the 27th of September previously, fourteen days before we made the request.

In our sworn affidavits, which we laid before you on the 30th ult., our superintendent and foremen swear they examined these goods on the 7th day of October, but *ten days* after they were received from the arsenal, and then found them in the condition they now are; and which you yourself saw upon your visit to our factory on the 5th instant. Our object in requesting the store-keeper to visit our factory and examine these goods was to show him they were moth-eaten, and also, as the important connecting fact therewith, that they had been sent to us so short a time previously, that it was impossible they could have been so injured while in our possession. This latter matter was the important fact, because without this it might be a question, as with the goods returned by us, whether the articles were injured *before* or *after* preparation. When the chief inspector and clerk called at our factory, they exhibited a letter from the store-keeper, directing them to examine the goods, and make a report of the result to him *in writing*.

You will remember that when the chief inspector was being examined by you at the arsenal, on the 4th instant, we asked him if he had made a report in writing of his examination of the goods at our factory. He replied that he had only made a verbal report. We then asked him what he had reported verbally, and he stated he had reported that he had visited our factory and found the goods in question moth-eaten, some of them in a worse condition than any he had seen returned to the arsenal, *and that he was satisfied they were so injured before they were sent to us*. Subsequently the store-keeper's chief clerk produced his book and showed you the entry, by which it was proved the goods in question were sent to us from the arsenal on the 27th September, and that, as we had returned all the goods to the arsenal previously sent us, it was impossible there could be any mistake or fraud in the matter of our statement as to the time when we received these goods.

Compare this full and plain statement with the store-keeper's report. He contents himself by limiting the report made to him verbally, by his agents, to the mere fact that they found the goods moth-eaten, but says not a word as to their report that the goods were in our possession so short a time as to render it a matter of absolute certainty they must have been damaged when sent to us. And he then goes on to give the result of what he alleges an examination of some seven hundred and fifty coats produced, and which, he says, showed but six injured. What does the store-keeper mean by this? Does he mean to be understood, by the suppression of a material, and *the material*, part of his agent's report, and his so-called examination of the coats at the arsenal, to covertly accuse us of *fraud*? Let the affidavits of our workmen, of Mr. Cowles, and our books, and the books of his own chief clerk, answer the insinuation, which he dare not make openly, and which no man who knows us would for an instant believe, even if we had no proof to sustain us.

We have the honor to be, your obedient servants,

GEO. A. COWLES & CO.

General L. C. EASTON,

Assistant Quartermaster-General, Philadelphia.

217 LEVANT STREET, PHILADELPHIA,
November 18, 1872.

SIR: In accordance with your request, we beg respectfully to make a protest, in writing, against permitting cloth prepared by us to be subjected to a process of "refinishing" by heat and pressure, as we believe it would be injurious both to our process and the cloth.

Some six weeks ago we made a verbal protest of the same character to the store-keeper at the Schuylkill arsenal, upon his informing us that certain parties had proposed to him to have the cloth thus "refinished." Notwithstanding our protest, we are given to understand that the store-keeper has permitted the parties in question to use this process of "refinishing" by heat and pressure upon cloth prepared by us, and that a large number of the garments which are being made up are from cloth treated in this manner.

The names of the parties who are having this "refinishing" done are Brantley & Leach.

We have the honor to be, your obedient servants,

GEO. A. COWLES & CO.

General L. C. EASTON,

Assistant Quartermaster-General, Philadelphia.

On the 22d of November we received from the Quartermaster-General an official copy of this report which he had received from General Easton:

DEPOT QUARTERMASTER'S OFFICE,
Philadelphia, Pa., November 22, 1872.

GENERAL: Herewith I have the honor to return the papers relating to some clothing at the Schuylkill arsenal, which has been discovered to be damaged by moths after being prepared by the process of Messrs. Geo. A. Cowles & Co. These papers were referred to me from your office October 23, 1872, for investigation and report; and, in accordance with your instructions, I have given the subject a patient and careful personal investigation.

The facts in regard to this clothing are fully set forth in the reports of Captain C. A. Alligood, military store-keeper, dated October 5th and 21st, and a repetition of them is here therefore deemed unnecessary. These reports are on file in the Quartermaster-General's Office, and attention is respectfully invited to them.

I have personally examined the garments referred to by Captain Alligood, and on one of them—a pair of trousers—I saw a live moth at work. That these trousers were prepared by Messrs. Cowles & Co.'s process there can be no doubt, as they bear the company's stamp. All articles treated by this firm are stamped by them with indelible ink. I have also examined other garments which have been eaten by moth after being prepared by the same company, and which were likewise marked with the company's stamp. The garments here referred to were trousers, and had not been subjected to the "refinishing" process of Messrs. Brantley & Leach. I refer to this for the reason that Messrs. Cowles & Co., in a communication addressed by them to this office on the 18th instant, protest against permitting cloth prepared by them to be subjected to the process of refinishing as is done by Messrs. Brantley & Leach, of this city, who have received prepared cloth from the arsenal to be made up into garments, they (C. & Co.) alleging that it injures their process. From what I know of this mode of refinishing, I do not see how it can impair the moth-repellent properties of goods prepared by Messrs. Cowles & Co.

They also refer to the mode of cleaning clothing at the arsenal, and the consequent exposure of their goods, the unprepared goods being cleaned in the same room with the prepared ones, &c. As regards this, I would simply state that the object of their preparation, as I understand it, is to render clothing moth-proof, absolutely and under all circumstances. If it does this, it is fair to expect that the clothing will withstand any exposure, no matter how great, without injury from moths. If the prepared goods are to be protected with the same care as the unprepared ones, I see no advantage whatever in the process.

In reply to an inquiry from this office, Captain Alligood reports that upon further examination (made since his last report) of great-coats that have been prepared by Messrs. Cowles & Co., about one per cent. have been found injured by moth.

This is a very small proportion, and if we were certain it never would be greater, the process would be a success and protection, as well as an economy, to the Government. But I see no reason why, if it perfectly protects a part of the garments, it should not protect all.

I would state, also, that they, (Cowles & Co.,) in reviewing the reports of Captain Alligood, place much stress upon the fact that there was stored at the arsenal a lot of Connecticut blankets, which were known to be infested with moths, and they attribute to this fact the existence of moths in goods prepared by them, &c. I examined this subject carefully, and found that these blankets were in such a condition and

stored in such a manner as not to endanger any clothing or material at the arsenal. They have since been sold and removed from the arsenal.

Another point raised by Messrs. Cowles & Co., in their report of October 19, and which they argue at some length, is, that clothing sent to them from the arsenal was moth-eaten before they received it, and they claim that it is reasonable to suppose that this was the case with some of the clothing here referred to. It is undoubtedly true, that in some cases moth-eaten goods, overlooked in examination, have been sent to them from the arsenal, but I do not see how this affects the question that moths have been seen at work on clothing *after* being prepared by them.

In view of the favorable reports of Captain Van Antwerp and others on the process of Messrs. Cowles & Co., I hesitate to condemn it, and would recommend that when the warm season again sets in the clothing heretofore prepared by them be thoroughly tested as to its moth-repellent properties, &c. Until the tests here suggested have been thoroughly made and fully reported on, I cannot recommend that any more clothing or material be given them to prepare.

I am, general, very respectfully, your obedient servant,

L. C. EASTON,

Assistant Quartermaster-General, United States Army.

The QUARTERMASTER-GENERAL UNITED STATES ARMY,

Washington, D. C.

To the above report we made the following reply:

OFFICE OF GEORGE A. COWLES & Co.,

217 Levant Street, Philadelphia, November 25, 1872.

SIR: We have the honor to acknowledge the receipt of your letter of the 23d instant, inclosing a report made by General L. C. Easton on the 22d instant, to whom you referred, on the 23d October, our communication to you of the 19th of the same month, in reply to certain reports made by the military store-keeper and the chief inspector of the Schuylkill arsenal regarding prepared clothing stored there.

You informed us at the time that your object in sending our communication to General Easton was in order to have that officer institute an investigation into our statements, and gather all the facts relating to the subject, so as to place you fully in possession of them. How far General Easton's report fulfills these conditions you of course will judge. But, as the parties interested in this matter, we may be permitted to state, most respectfully, that General Easton's report presents no new facts whatever as to the investigation he was directed to make; excludes us from the benefit of the facts which we elicited at the examination he held at the arsenal; and re-affirms the store-keeper's statements, which we disproved under oath, and which the store-keeper, as we show hereafter, failed to prove by his own witnesses.

We regret to find that General Easton not only states, as conceded facts, important matters which were denied and refuted in the most solemn manner under oath, and by the store-keeper's own witnesses, but that he did not deem it necessary to forward to you with his report our written statements, made to him in his official capacity, and with the request at the time that these statements should be placed upon the record as a continuation and part of the case, as presented to you in our communication of the 19th of October last, and referred by you to him.

Not only has he omitted to send these statements, but he also makes no mention of the details of his examination at the arsenal, when we were present, and a report of which we drew up and forwarded to him on the day following the said examination, namely, on the 5th instant, and to the accuracy of which we made affidavit. This examination was an important matter, because we were enabled to elicit the fact that the store-keeper's reports, by systematic concealments, made out an apparent case, which a cross-examination of the store-keeper's own witnesses (and all the persons examined were his witnesses) proved conclusively to be baseless. A suppression of the truth, in law and in morals, with the purpose of doing an injury, is as grave an offense as the deliberate utterance of a falsehood. We proved the store-keeper had been guilty of this continuous suppression of the truth in all his reports; and the examination held by General Easton at the arsenal established it. If we incorrectly reported the proceedings at this examination, our error should have been pointed out. But that we did not do so is seen in the fact that our sworn report is not attempted to be called in question; it is simply ignored, as having no existence, as is our request that it may be made a part of the record. We maintain that, in the report which we have given of the examination at the arsenal, held in our presence, we have stated correctly and fully the facts there developed, and we beg respectfully, but firmly, to submit that when General Easton saw fit to ignore that report, and to give no details himself of the investigation at the arsenal, he did us a grievous wrong.

But General Easton's report is open to even a more serious complaint. He has fallen into the error of stating that the goods were injured to the extent of one per cent. after

having been prepared by us. There was not a particle of evidence taken by General Easton, in our presence, to prove this, nor does he bring forward any such evidence in his report. On the contrary, the only evidence given, or in any way produced, by the store-keeper's witnesses, showed that *one* pair of trousers had been found with a moth upon them, and that two other pairs were exhibited, which it was presumed were injured after having been prepared by us. In our communication of the 5th instant, (which will be found herewith,) we have gone fully into this matter, and we beg to refer to it. We deny in toto that a single fact, beyond what we have officially presented, was proved by the store-keeper in his examination, although he had only his own witnesses examined, and we had to elicit the facts, after much labor, by cross-examination. Yet, although we claim to have refuted the store-keeper's statements, by the simple process of eliciting *all* the facts, General Easton assumes that the store-keeper's reports are true, and quietly puts our examination and affidavits aside, as an easy method of disposing of them, without even recognizing their existence.

General Easton misstates our position, when he assumes that we take the ground that our prepared goods have been moth-eaten because they were exposed to an atmosphere where the floss and dust from the unprepared clothing was wafted and blown upon them. Our statement to you of the 19th October, and our subsequent communications to General Easton, will show we did not take any such ground; and, as we give them below, it can be seen at a glance that our complaint against General Easton in this respect is well founded. What we did state was, that, as the inspector declared he had seen moths on our prepared coats—but four in all—and as he also declared he could see no evidence they had injured the coats upon which he saw them, it was evident they were feeding *not* upon the prepared goods, but upon the floss or dust shaken off of the unprepared goods, in such quantities, as the inspector declared, that it could be taken up by the thumb and fingers. That this was evident, also, from the fact stated by the store-keeper, as well as the inspector, that more moths were seen on the cotton linings than anywhere else, and that, as moths will not eat cotton, they *must* have been feeding on the floss or dust from the unprepared clothing which had fallen on the linings, as they lay uppermost. We cannot believe General Easton took the trouble to read our statements, or he could not have so strangely misunderstood us. As for the trousers upon which General Easton saw the live moth, we adduced proof—the statement of the store-keeper's chief clerk—to show that these very trousers had lain about the workshop of a private firm, outside the arsenal, for months; and that we could not possibly tell, therefore, to what treatment they had been subjected. No reasonable man will contend, we suppose, that our process, or any process, cannot be so ill-used as to destroy it; and we are entitled to the benefit of the doubt which must be felt as to whether it is a *fair* test to take a piece of prepared cloth, and toss it about a private workshop for months, subject to all the vicissitudes of such a condition, and then hold it up to our vision, if it should get a moth on it, as evidence of our failure. While, “in close proximity,” the store-keeper and the chief inspector both acknowledged prepared goods were found exposed for a much longer period, which were wholly uninjured by moth. But these latter goods had not undergone the ordeal of being tossed about for several months in a private workshop outside the arsenal.

As if injustice enough was not already done us, General Easton alludes to our protest against the “refinishing” process of Brantley & Leach, and expressing his opinion that it cannot possibly injure the cloth, reflects upon us for protesting against its use. He declares, that from what he knows of this “refinishing” process he “cannot see how it can impair the moth-repellent properties of goods prepared” by our process. We cannot say what facts General Easton bases this opinion upon, especially as in a former report he states he does not know the chemical re-agents we use. But we do know that the process used by Brantley & Leach consists in heating iron plates so hot by direct fire-heat that they “hiss” when touched by water, and that should this heat be as high as three or four hundred degrees, which it may well be, as no means are adopted to regulate it, it would not only injure our process, but destroy the life of the cloth itself. And that, this being the case, our protest was at least entitled to some consideration, especially as we are held responsible, as in the case of the pair of trousers, for all future damage which may result to the goods, no matter how much they may be abused, injured, or even burnt.

The store-keeper, it is stated by General Easton, in reply to an inquiry from him, reported that “about one per cent.” of coats prepared by us have been found injured by moth. But no proof is vouchsafed of the truth of this statement, and which we utterly deny. In our various communications we have shown that there was no proof that *any* coats had been moth-eaten *after* we had prepared them. It does not even appear that the store-keeper alleges that this “one per cent.” of coats was injured by moths *after* having been prepared by us, and that they were not so injured before they were subjected to our process, as was the case with the coats in our factory last sent us from the arsenal. (See affidavits, p. 23.)

In the examination at the arsenal, the only proof of injury to our prepared goods, after we had prepared them, summed up *one* pair of trousers directly and two pairs by

inference, in all *three garments*, out of about twenty-five thousand, or *about one-eighth-thousandth of one per cent.* The only evidence of moth was *four* declared to have been seen by the chief inspector, three by one of the workmen, and one of the three by another workman, and a loose statement that the workmen had "heard" of *thirteen* moths in all having been seen at one time or another; and these workmen, it should be borne in mind, have brushed and baled up not less than twenty-five thousand of the fifty thousand garments prepared by us. Yet, with this absolute proof of the misstatement of the store-keeper, and without adducing a scintilla of proof to sustain it, General Eaton not only assumes it to be correct, but intimates it may, in time, be found to be even larger, by suggesting further tests.

General Easton states in his report, when speaking of the trousers alleged to be injured by moth, "that these trousers were prepared by Messrs. Cowles & Co. there can be no doubt, as they bear the company's stamp. All articles treated by this firm are stamped by them with indelible ink." While we have not denied that the trousers in question may have been made from cloth prepared by us, and have suggested the probable cause of the injury, yet we are compelled to notice the inaccuracy of General Easton's statement, even in this regard. We do not stamp trousers made from cloth prepared by us, the stamp is put on after the trousers are made up, by the arsenal authorities, and we are no more responsible for it than we are for any other act of persons over whom we have no authority or control.

As for General Easton's statement regarding the Connecticut blankets, we simply refer to the evidence of the person in charge of them, which will be found in our sworn communication of the 5th instant, as follows:

"With regard to the Connecticut blankets, the fact was clearly elicited, after much difficulty, from the person in charge of them, that they had been left exposed and uncovered in the cellar of the building where they were stored, with the doors and windows constantly open, with the men attached to the arsenal continually going in and out of the cellar, or, as the witness expressed it, making it a 'thoroughfare,' till *about six weeks ago*, when, *for the first time since these blankets were in the store*, they were covered up and the cellar-doors kept closed. The 'about six weeks ago,' mentioned by the person in charge, coincides with the time when this question of moths upon our goods first arose."

We beg, with great respect, to ask the Quartermaster-General's attention to the documents which we subjoin, and which we supposed, until we received General Easton's report, that officer would consider as part of the record, in compliance with our not unreasonable request. And among these documents will be found our communication of the 30th of October, in which we practically guarantee the success of our process, by requiring payment only for moth-proof work.

We also beg the Quartermaster-General will take into consideration the long-continued tests, of the severest character, which our process has undergone for the past three years at the hands of the Department, and which the official records show it passed unscathed. And we also beg that he will note the fact that, in all the Army posts, no goods shown to have been treated by our process have been moth-eaten. And we then ask whether, with this abundance of proof in our favor, and with the result of the investigation at the Schuylkill arsenal, we have not a right to complain of the injustice of General Easton's report, and to repeat our request for the creation of a board to properly, thoroughly, and intelligently investigate the matter? As for the suggestion of still further tests, it can scarcely be seriously made, in view of the prolonged tests already had. If after three years of the severest tests the Department could institute, no case can be made out against our process, it is not probable a further delay would develop any new facts. We ask only for a clear and intelligent examination of the facts by a board of officers of high rank, who will be empowered to examine all the witnesses under oath—our workmen as well as those of the arsenal—and that we may be permitted to be present so as to elicit all the facts, feeling convinced that that alone is necessary for our complete vindication.

We have the honor to be, your obedient servant,

GEORGE A. COWLES & CO.

Major-General M. C. MEIGS,

Quartermaster-General U. S. A., Washington, D. C.

General Meigs, after a full consideration of the case, set aside General Easton's report, and recommended that our request for the creation of a board should be complied with, in the following report to the honorable the Secretary of War:

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., December 7, 1872.

SIR: I have the honor to inclose the report of Colonel L. C. Easton, Assistant Quartermaster-General, upon the process of Cowles & Co.; also a printed pamphlet, submitted by the patentees, in which they review the testimony.

General Easton has not yet reached a definite conviction on the subject.

Their review of the evidence in the case leaves me in doubt, though I incline to the belief that they have shown that the damage alleged to have been done to cloth prepared by them was probably in most, if not in all cases, done before the cloth was subjected to their process; and that the moths seen upon the garments in question were not bred there, or were feeding upon loose woolen dust or "fluff," which had settled upon them in the process of brushing moth-eaten clothing. This dust is known to be very attractive to moths.

I think it only just that the United States take measures to determine this question as quickly as possible, as the contractors are subject to expense during any delay; and I therefore recommend that a board of officers be directed to examine the garments at the arsenal thoroughly, allowing the contractors to be present at any examination of witnesses; and that their report be used in finally determining this question.

It is one of great importance, both to the War Department and to the contractors, and it is not now in a condition to be determined with certainty.

My mind at present inclines to the belief that the process, so far as it relates to the protection of woollens from ravages of moth, is successful. But considering the adverse opinion of the officers who have had charge of the property, I cannot recommend proceeding with the work without a definite and clear decision.

All papers on file relating to the subject should be laid before any board ordered.

I recommend that a board of three officers be designated by the Secretary of War, with instructions to investigate this matter, and report whether it is advisable to go on with this process or not.

M. C. MEIGS,
Quartermaster-General U. S. A.

The Honorable SECRETARY OF WAR,
Washington, D. C.

The Secretary of War approved General Meigs's recommendation for the creation of a board, and issued Special Orders No. 329 to that effect. This order will be found in the proceedings of the board, page 5.

Papers referred to by the board in their report.

Among the papers submitted to the board were the following reports and communications from the Quartermaster-General. The first is a communication to the Secretary of War, upon the general subject of processes for the preservation of woolen and cotton goods, and is important as showing the thorough knowledge possessed by General Meigs upon the scientific questions involved:

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., April 24, 1871.

Respectfully submitted to the Secretary of War, in obedience to instructions of the 18th instant:

I beg to call the attention of the Secretary of War to the fact that there are several patented water-proofing and preservative processes, which at first introduction are pressed by those interested, supported by experiments apparently showing their great value, but which in a few years disappear, and are not again heard of in use.

The kyanizing process, thirty years ago, was extensively introduced and used. It did, in a great measure, prevent mildew in canvass, and it was alleged that careful experiments in English dock-yards proved that it preserved timber from dry-rot. I believe it is now used nowhere, though it was adopted by the Engineer Department, and used for its timber constructions, and also by railroads in preserving sleepers. There have been many since—burnettizing, chloride of zinc, sulphate of iron, petroleum, carbolic acid, &c.

No process should be extensively applied to such costly articles as tents and clothing, until it has been tried in actual use. Any odor, any discoloration of the clothing, will lead to the rejection of the clothing and tents by the officers and troops for whom they are provided.

Complaints frequently reach this office that even the use of petroleum paper as a lining for boxes or bales in which clothing is packed, by discoloration, makes the clothing very objectionable to the troops.

I adduce these things only to show that great caution should be observed in dealing with these inventions. Nothing should be used without a full knowledge of the material and process used.

Some of the most effectual preservatives are poisonous. That which will poison in-

sects, vermin, and spores of the cryptogamic plants, which produce mildew, is sometimes powerful enough to be injurious to man.

The kyanizing process, one of the most successful, depended upon corrosive sublimate as its effective preservative agent.

Respectfully,

M. C. MEIGS,
Brevet Major-General, U. S. A., Quartermaster-General.

The process of George A. Cowles & Co. having been brought to the attention of General Meigs by the reports from the officers of the Schuylkill arsenal, (General Van Antwerp's and Mr. Neil Campbell's reports,) the Quartermaster-General, on the 5th of June, 1871, addressed the Secretary of War the following report :

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., June 5, 1871.

SIR: I have examined certain articles of cotton tents and woolen clothing which have been subjected to the patent process of Messrs. Cowles & Co., of New York, and which have been the subject of reports sent to the War Department on February 28, March 4, and April 24, 1871.

I think that the results of this experiment, viewed in connection with the testimony of many persons who have used canvas and cloth prepared in this mode, justify a trial on a more extended scale in actual use.

The owners of the patent have filed a description of their process, and a statement of the chemical re-agents used. They are not corrosive, nor are they, I believe, likely to be injurious to the material, or to those who use the articles thus prepared.

A copy of the letter of Messrs. Cowles & Co. is with this report.

It is suggested that this firm be requested to state the terms on which they will prepare 10,000 garments of all kinds, 1,000 tents, 50,000 yards sky-blue kersey; and that, if these terms are reasonable and satisfactory, these tents and garments, or the material for making them, be subjected to the process, and the articles made from this prepared material, properly marked, be issued, in filling requisitions, with equal quantities of the ordinary articles unprepared, and subjected to the test of actual use, side by side with those not water-proofed and mildew-proofed.

Very respectfully, your obedient servant,

M. C. MEIGS,
Quartermaster-General, Bvt. Major-General, U. S. A.

Hon. W. W. BEELKNAP,
Secretary of War, Washington, D. C.

On the 21st December following, General Meigs being absent from Washington, General Allen, Acting Quartermaster-General, addressed the subjoined letter to the Secretary of War, as to the result of the process since the date of General Meigs's report of the 5th June:

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., December 21, 1871.

SIR: In obedience to instructions of this day, I have the honor to report that, under authority of the Secretary of War, certain articles of clothing and tents, and a quantity of clothing materials, have been submitted to the patented process of Messrs. Cowles & Co.

All the prepared articles have been, or are being, distributed to the Army for test in actual service.

Thus far no reports have been received, but it is believed that the result will prove satisfactory.

From trials at the Schuylkill arsenal, this Department is favorably impressed with the test to which some of the prepared articles of clothing, &c., have been submitted.

In view of the great loss already sustained by the Government from damage to clothing by moths, and the fact that the manufacture of clothing has been resumed and will increase yearly, as the old stock left on hand at the end of the war becomes exhausted, it is important that the Department be provided with the means to prevent such damage in future, if possible.

Moths are already in much of the old stock of clothing now at the military posts,

and unless prevented they will be found in the new clothing soon after its arrival at such posts.

Very respectfully, your obedient servant,

ROBERT ALLEN,
Acting Quartermaster-General.

To the Hon. the SECRETARY OF WAR,
Washington, D. C.

On the 25th March, 1872, General Meigs addressed the following letter to the Hon. Cornelius Cole, giving the results generally gathered by the Department up to date, as to satisfactory results of the process :

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., March 25, 1872.

SIR: At the request of the Hon. J. R. West, of the committee, I have the honor to furnish such information as is in this office in regard to the application of the process of Cowles & Co. to Army clothing and equipment. During the past two years, experiments have been made by this Department to test the merits of this process, and the results so far are satisfactory.

There are now in store at the principal depots of this Department more than four million dollars' worth of clothing liable to be destroyed by moths; and if it can be rendered moth-proof a large saving will result to the Government.

Coats prepared by this process and exposed to the action of moths for sixteen months were untouched by them. One with live moths rolled up in it, after five weeks, was found uninjured, save in one small spot on the nap.*

Cotton tents wet and placed in a cellar on the damp floor, and allowed to remain thirteen months, were not mildewed, and proved on examination to be almost as strong as before.

Linen tents, of which there are several thousands on hand, have lately been considered unfit for issue to the Army, not being water-proof.

A few have been submitted to this process, and exposed to heavy rains, and have proved to be water-repellent. The inspector reports in relation to them—

"I think, from what I have seen of these tents, that they are good, serviceable, and a water-repellent. If all the linen tents were so prepared, I think they might be issued."

* * * * *

Very respectfully, your obedient servant,

M. C. MEIGS,
Quartermaster-General, Brevet Major-General, U. S. A.

HON. CORNELIUS COLE,
Chairman Committee on Appropriations, U. S. Senate, Washington, D. C.

Reports made by General Van Antwerp and Mr. Neil Campbell, referred to by the board.

SCHUYLKILL ARSENAL, Philadelphia, Pa., April 20, 1871.

COLONEL: In obedience to the following order of the 18th instant, from the Secretary of War, received by telegraph through the Quartermaster-General's Office, to wit:

"Captain V. P. Van Antwerp, military store-keeper: The Secretary of War directs that you report at once such facts as may have come to your knowledge as to the tests made in connection with G. A. Cowles & Co.'s process, and your own opinion thereon.

By order of the Quartermaster-General.

"J. D. BINGHAM, Major and Quartermaster"—

I have the honor to report—

1st. A note addressed by me upon the subject to Mr. Neil Campbell, inspector at this depot, together with his answer thereto, marked "A," and herewith inclosed.

My opinion, as regards the process of Messrs. George A. Cowles & Co. to protect clothing against the ravages of moth, accords with that expressed by Mr. Campbell, in the last clause of this report of his to me: that "had the cloth and clothing belonging

* The report shows that for eighteen months this coat had been subjected to the process, and that no moth-spot had been discovered in all that time. A couple of weeks thereafter the spot referred to by General Meigs was noticed. From the cumulative proofs in the report herewith presented, it is evident the spot was in the coat before being subjected to the process, but was overlooked at the time.—G. A. C. & Co.

to the Government, for the last ten years, been treated by this process, (that of Cowles and Co.,) the results would have been the saving of a large amount of money to the Government."

The tests made here of that process, with the results thereof, prove conclusively, to my mind, that it is of much value for the purpose mentioned. No application hitherto used for such a purpose—neither camphor, nor tobacco, nor "petroleum paper," nor any other preparation that has come to my knowledge—has proven a thorough preventive of the damage to clothing by moth.

Such was my experience during the three years, from May, 1867, till May, 1870, that I was in charge of the United States military depot for Army clothing in Texas, (at San Antonio,) and so it has been here.

Repeatedly, while at San Antonio, I was obliged to sell at public auction, and necessarily at a sacrifice, considerable quantities of clothing that had come to me with paper saturated with petroleum or carbolic acid placed all through it; but which, nevertheless, on being opened, was found to be damaged by moth. So here, too, a sale ordered, and which took place last fall, embraced a large amount of clothing, much of which was moth-eaten, and sold on that account.

Again, another large sale, ordered here for next month, includes no inconsiderable quantity of moth-eaten clothing. Yet this clothing, as well as that sold here at public auction last fall, had been put up in "petroleum paper."

Not unfrequently it happened in San Antonio that, on opening boxes filled with clothing thus prepared, it was found to be badly stained, and thus damaged the effect, as was believed, of the process to which it was subjected, so as to render necessary its sale at public auction. Hence, my opinion is, that the process of Messrs. Cowles & Co., as a remedy against the great injury done to clothing by moth, and as tested here, with the results of such tests, is a superior one to that of the "petroleum paper," which has so often proved inadequate where I have seen it tried. In regard to the water-repelling process of Messrs. Cowles & Co., for application to tents and flies, my attention was not called to the matter till the last examination of the results of the experiments, which was had in December, 1870, when the articles had undergone the severest possible tests for many months, some of them over a year. Referring to Mr. Campbell's report to me, herewith submitted, he says, in regard to the severest tests made upon a tent and fly, and the final result of which I saw in December, 1870:

"In August, 1869, a tent and fly, prepared by Messrs. Cowles & Co., were thoroughly wet, rolled up, and placed in the cellar of one of the store-houses, in immediate contact with the floor. In February, 1870, six months after, they were examined, no indication of mildew appearing on the fly. On the tent, spots appeared, which I at first believed to be mildew, but a recent and more thorough examination has convinced me was not. The tent and fly were again wet February, 1870, and placed, as before, in the cellar.

"On the 23d of September following, and thirteen months after the first wetting, they were again examined, no indication of mildew appearing on the fly. On the tent were several small places of mold, but by being rubbed between the hands it was nearly all removed from the surface, the thread appearing to be almost as strong as before the wetting of the tent. After this they were wet for the third time, rolled up as before, and placed in the same position in the cellar, (that is, 'in immediate contact with the floor.') On the 2d of December, ten weeks after, they were again examined, the fly showing no indication whatever of mildew, the tent showing an increase of spots, nearly all of which could be removed by rubbing as before."

This last examination of the tent and fly, when they had been subjected to the very severe test just described, thoroughly wet, rolled up, and placed in the cellar of a store-house, in immediate contact with the floor, where they remained some sixteen months, I witnessed on the 2d of December, 1870, and the condition of the articles, as has been described, is correct. There was no indication whatever of mildew on the fly. There were spots on the tent, of a green or brownish color, that could be removed by rubbing, and which, as I think, were neither mildew nor mold, nor did they seem to me to impair at all the strength of the fabric.

Having previously to this last unusual and extraordinary test, (a tent wet through with water, and placed for ten weeks upon the floor of a cellar,) been "thoroughly wet," and in the same cellar for over a year—making sixteen months in all that it was there—to have found it, after such treatment, not mildewed, would have seemed incredible. That the fabric was not utterly rotten and destroyed, as must have been the case with tent-cloth unprepared in some way to protect it against damage, on being similarly treated, was to me surprising. The first two examinations above described of the tent and fly, one at the end of six and the other thirteen months, (when the "spots" upon the tent—there being none whatever upon the fly—could be "removed by being rubbed between the hands,") furnish sufficient evidence, I think, that there was no mildew upon them.

As regards the first examination, (after as severe tests as that described—that is to say, by thoroughly wetting the articles, rolling them up, placing them upon the floor

of a cellar, and letting them remain there, undisturbed, in that condition for the period of six months,) Mr. Campbell states that he is convinced, after a "thorough examination, that there was no mildew upon them."

Now, again, as regards this matter, my experience is that tent and flies, rolled up wet, or damp, even, and put away so, in a perfectly dry and well-aired store-house above ground—not upon the floor of a cellar—unless prepared in some way to protect them against it, will become mildewed, if they do not, in fact, rot, and become so offensive as to make it necessary to remove them, within less than six months after being thus treated.

Having sometimes had them "turned in" to me in such condition, when unconscious of it, (I speak advisedly upon the subject,) my opinion is, therefore, that the process of Messrs. Cowles & Co., as a water-repellent and mildew-preventive, to preserve tents and flies from damage, as tested by experiments at this depot, is one that may be made of great value. Referring again to the report made to me by Mr. Campbell, the inspector, and herewith inclosed, I fully concur with him in regard to this matter, as well as to the process to prevent the ravages of moth in clothing, that, "had the cloth and clothing and tents belonging to the Government for the last ten years been treated by this process, (that of Cowles & Co.,) the result would have been the saving of a large amount of money to the Government."

I am, very respectfully, your obedient servant,

V. P. VAN ANTWERP,

Military Store-keeper, United States Army.

Lieutenant Colonel STEWART VAN VLIET,

Deputy Quartermaster-General U. S. Army, Philadelphia, Pennsylvania.

UNITED STATES ARSENAL, April 19, 1871.

CAPTAIN: In obedience to your instructions of the 17th instant, I have the honor to report that the following are the nature and result of the tests applied to certain articles of clothing and equipage treated by Messrs. Cowles & Co., by their moth and mildew preventive and water-repellent process:

On the 11th day of August, 1869, four great-coats (treated by C. & Co.'s process) were spread out in one of the rooms, in order that they might be exposed to the action of moths. In December, 1870, nearly sixteen months after, I examined these coats, and found no indication that they had been touched.

As a further and more severe test, I, on the 1st of March, 1871, caught some twelve or fifteen moths and placed them alive in one of the great-coats treated by C. & Co.'s process, rolled the coat up with the moths inside, and put it aside for five weeks. When opened and examined, I found the moths alive and the coat untouched, save in one small place on the nap, requiring close scrutiny to find it.

In August, 1869, two tents, prepared by Messrs. Cowles & Co., as well as others taken from our stock on hand, were submitted to the following tests:

In August, 1869, one of the prepared and one of the unprepared tents were set on the grounds at this depot, where they remained exposed to the action of all weathers for fourteen months. An examination of both tents at that time showed small green spots on the prepared tent, which a further examination has satisfied me was not mildew. The unprepared tent was spotted all over with mildew; but the strength of the material in both tents was about the same.

At the same time (August, 1869) a tent and fly, prepared by Messrs. Cowles & Co., was thoroughly wet, rolled up, and placed in the cellar of one of the store-houses, in immediate contact with the floor. In February, 1870, six months after, they were examined, no indication of mildew appearing on the fly; on the tent, spots appeared which I at first believed to be mildew, but a recent and more thorough examination has convinced me was not. The tent and fly were again wet, February, 1870, and placed, as before, in the cellar. On the 23d of September following, and thirteen months after the first wetting, they were again examined, no indications of mildew appearing on the fly. On the tent were several small places of mold, but by being rubbed between the hands it was nearly all removed from the surface, the thread appearing to be almost as strong as before the wetting of the tent.

After this examination they were wet for the third time, rolled up as before, and placed in the same position in the cellar.

On the 2d of December, ten weeks after, they were again examined, the fly showing no indication whatever of mildew, the tent showing an increase of spots, nearly all of which could be removed by rubbing, as before.

On the 23d of September, 1870, I wet two tents, one prepared by Cowles & Co., and one unprepared, and placed them in the upper story of one of the store-houses, near the roof. When examined, ten weeks after, the prepared tent was covered with light-colored moldy spots, nearly all of which could be removed by rubbing; the unprepared tent was covered with a black mildew, which could not be removed by rubbing.

Such have been the tests applied to the articles treated by Messrs. Cowles & Co.—a far more rigorous one than actual service could apply. From the nature of these tests I feel perfectly satisfied that had the cloth, clothing, and tents belonging to the Government for the last ten years been treated by this process, (Cowles & Co.'s,) the result would have been the saving of a large amount of money to the Government.

I am, very respectfully, your most obedient servant,

NEIL CAMPBELL,
Chief Inspector.

Captain V. P. VAN ANTWERP,
Military Store-keeper, United States Army.

SCHUYLKILL ARSENAL, *Philadelphia, January 30, 1872.*

COLONEL: Referring to your letter of yesterday upon the subject, I now have the honor to submit herewith a communication addressed by me to Mr. Neil Campbell, inspector at this depot, together with his report.

I have made further and personal inquiry as to the test made with the great-coats, and do not hesitate to indorse the report made by Mr. Campbell upon the subject, as to their being a protection against rain. While the ordinary overcoat, unprepared by the water-proofing process, will become wet through, those thus prepared by Cowles & Co. keep the men, as stated by Mr. Campbell, perfectly dry.

The other points also, reported by the inspector, have my full concurrence.

Very respectfully, your obedient servant,

V. P. VAN ANTWERP,
Military Store-keeper, United States Army.

Lieutenant-Colonel STEWART VAN VLIET,
Deputy Quartermaster-General, United States Army,
Philadelphia, Pa.

SCHUYLKILL ARSENAL, *Philadelphia, January 29, 1872.*

SIR: Several months ago some great-coats, which had been subjected to the water proofing process of Cowles & Co., were issued to the watchmen on duty here at the arsenal, to test the value of such process.

You will now report without delay the result of the experiment: whether or not such coats, thus treated, were a protection to the men when exposed to rain-storms, or to what extent.

Also, whether or not the kersey sent to Cowles & Co. for treatment was sponged before being sent to them; whether the cloth now being cut up for pantaloons is sponged; and if the kersey and cloth are not sponged, would, or not, this account for the shrinkage of the garments when subjected to the process of Cowles & Co.?

Very respectfully, your obedient servant,

V. P. VAN ANTWERP,
Military Store-keeper, United States Army.

Mr. NEIL CAMPBELL,
Inspector, &c.

UNITED STATES ARSENAL, *January 30, 1872.*

SIR: I have the honor to report, in obedience with your instructions of this date, that the kersey and clothing treated by the process of Messrs. Cowles & Co. were not sponged before being treated. All cloths should be sponged before being made up into clothing; if not sponged, the first wetting causes the cloth to spot and shrink, and lose its gloss. The color of the cloth is not affected by the process of C. & Co., and the slight shrinkage that takes place adds to the strength of the material. I have tested the kersey both before and after being treated, and find the strength is increased after treatment.

Some seven of the great-coats treated by C. & Co. have been used by the watchmen at this depot during the heaviest rain-storms for the last three months. The test was a practical one, and as severe as can with reasonable wear ever be applied. The testimony of the watchmen, so far as water-repelling power is concerned, is very favorable. While the coat in a measure absorbs the moisture, the rain does not penetrate, and the men are kept perfectly dry. I have also tried the kersey after being treated, and find that water does not adhere to the fiber, as in kersey unprepared.

This process has the same effect as sponging, and answers that purpose. It has not

been the custom to sponge cloths before being made up into Army clothing, and the process of C. & Co. answers a good purpose in that way, as all cloths should be sponged before being made up.

I am, very respectfully, your most obedient servant,

NEIL CAMPBELL,
Chief Inspector.

Captain V. P. VAN ANTWERP,
Military Store-keeper, United States Army.

SCHUYLKILL ARSENAL, Philadelphia, July 2, 1872.

COLONEL: In reply to your communication of June 22d last, referring copy of letter of the Quartermaster-General, dated June 17, relative to the treatment of clothing by George A. Cowles & Co., I have the honor to report—

That on the 20th of April, 1871, a full report was made upon this process, both as regards its effect upon woolen goods and canvas. In that report was given the result of a test of sixteen months upon a tent and fly, both of which had been kept in a damp cellar and wet several times, of which I said, in speaking of the test: "Having previously to this last-mentioned and extraordinary test (a tent wet through with water, and placed for ten weeks upon the floor of a cellar) been 'thoroughly wet,' and in the same cellar for over a year, making SIXTEEN MONTHS IN ALL that it was there, to have found it, after such treatment, *not* mildewed would have seemed incredible! That the fabric was not utterly rotten and destroyed, as must have been the case with tent-cloth, unprepared in some way to protect it against damage on being similarly treated, was to me surprising."

Since making the report above mentioned no further tests have been made with cotton goods.

With woolen material, however, further experiments have been made, the result of which increases my faith in this process as a moth-preventive. Some three months ago a lot of blankets was received at this depot from the State of Connecticut. These blankets were literally alive with moths, and were packed away with all possible haste, in order that the stock on hand should not become infected. In one of these boxes, on the 30th of April, were packed three prepared great-coats and three prepared pairs of trousers, and when opened this morning they were as bright and fresh as when packed away, and no trace of moth to be seen, although the blankets are very badly eaten. This experiment, lasting through the months of May and June, the latter month a very warm one, seems to be an almost convincing proof in favor of this process as a "moth-preventive."

My attention being invited particularly to the subject of the effect of the process upon the strength of the material, the unpleasant smell arising from the ingredients used, and the great change in the appearance of the goods,* after washing, I have simply to refer to my report of the 1st instant, and that of the chief inspector, forwarded at the same time. The allegation that the strength of the material was unfavorably affected, that there was an unpleasant odor attending goods so treated, was thoroughly refuted by the testimony of the night-guard at this depot—testimony taken after an experiment (and a very practical one) embracing nine months.

The great-coats worn by these watchmen are still in my office, and can be forwarded to you for transmission to the Quartermaster-General, if so desired. The chief inspector has been testing the merits of this process by my directions, and the result of his experiments appears in his report to me, which I send herewith. All the clothing treated by this process has been baled in burlaps, with no other protection than the wrapping-paper. This clothing I had so baled for the reason that, if it is proof against the ravages of the moth, it is useless to expend more money for petroleum paper.

In no single instance have I discovered that any of this clothing, some of it packed nearly a year, has been moth-eaten.

I view of the above facts, I cannot but believe that this process will be of great use to the Government as a moth-preventive, and to the soldier in the field as a "water-repellent," which latter is, to my mind, fully established by the testimony of the night-guard.

Very respectfully, your obedient servant,

V. P. VAN ANTWERP,
Military Store-keeper, United States Army.

Lieutenant-Colonel L. C. EASTON,
Deputy Quartermaster-General, United States Army, Philadelphia.

* This is with reference to a statement made by an officer at Buffalo, New York, as to the effect of the process on the clothing; but which clothing, when sent to the arsenal, was found NOT to have been treated by Cowles & Co.

SCHUYLKILL ARSENAL, *Philadelphia, July 2, 1872.*

CAPTAIN: In obedience to your instruction, I have the honor to report that, since my appointment as chief inspector, in February last, I have been experimenting upon clothing and materials treated by the process of Messrs. Cowles & Co., both as regard its effects as a moth-preventive and water-repellent.

My experiments with regard to moth consisted in packing clothing during the month of April in a lot of blankets which was received from the State of Connecticut, and which you know to be filled with moths, and where, if there was any possibility of clothing being eaten by moths, this was the place. When the box was opened by me to-day no trace or sign of moths was to be seen except in the blankets they were wrapped in. My opinion is, that the ingredients used—what they are I know not—are such that no moth will eat.

I have also examined very carefully a number of bales of clothing treated by Cowles & Co. about a year ago; so I am informed. This clothing was baled without petroleum-paper, simply in burlap, lined with ordinary wrapping-paper. This was done, I suppose, by your instruction, and to test the merits of the process. This clothing has now been subjected to the heat of a warm summer, a number of bales left open in the store-house, also, I believe, by your orders; and I have failed to discover any garment, although I have examined many, in the least moth-eaten. I know of no better experiment than this, and confess that I would hesitate to expose clothing not treated by some process in such a manner.

In relation to the water-repellent properties of this process, the verdict of the night-watchmen at this place is a very strong one. The coats worn by them are now in my office by your orders, and have been *well worn*.

They do not appear to me to be in any way weakened in strength or changed in color; and it is my opinion the color is improved by this process, particularly in the goods done in the piece, as the making-up afterward and pressing bring out the proper finish, which cannot be done so well when made up. Looking at the whole process, as far as I have gone, as a moth-preventive, and, as I have before said, its improvement of the cloth, particularly when done in the piece, and if it should, as I think it will, stand another summer, in my opinion it is and would be a very valuable agent for the Government.

Very respectfully, your obedient servant,

FRANK S. JOHNSTON,
Chief Inspector United States Arsenal.

Captain V. P. VAN ANTWERP,
Military Store-keeper, United States Army.

SCHUYLKILL ARSENAL, *Philadelphia, June 23, 1872.*

COLONEL: Referring to the communication of the Quartermaster-General, dated June 25, 1872, with your indorsement thereon directing me to report upon the great-coats treated by George A. Cowles & Co., and worn by the night-watchmen at this depot, I have the honor to state, that in the latter part of October, 1871, six great-coats treated by Messrs. Cowles & Co. were given to the night-watch at this depot, with directions to test them thoroughly, for the purpose of ascertaining whether or not the process by which they were treated made the coats "water-repellent."

The names of the watchmen by whom these coats were worn are: John Fryburg, captain of watch; Samuel Price, Robert McFeeters, Lewis H. Sweeney, Martin C. Courtney, Isaiah Smith, Conrad Miller, Thomas Patterson, John Cross, C. Edward Miller, and Samuel Clarke.

For the purpose of answering the inquiries of the Quartermaster-General, I examined privately each of the above-named watchmen, and reduced their testimony to writing, which testimony I have the honor to send herewith.

The information desired by the Quartermaster-General appears so fully in the statements of these watchmen, and is given after an experience of some nine months, during which time, as will be seen, the coats were almost constantly worn, that I respectfully forward the same for your consideration, without further remarks.

Very respectfully, your obedient servant,

V. P. VAN ANTWERP,
Military Store-keeper, United States Army.

Lieutenant-Colonel L. C. EASTON,
*Deputy Quartermaster-General,
United States Army, Philadelphia.*

Statement of JOHN FRYBURG, captain of the night-watch.—About nine months ago I was given six (6) great-coats, which General Van Antwerp directed me to distribute among the night-watch under my charge, to see if they were water-proof. They were

part of a lot treated by a company in New York: I don't remember the name now. All the watchmen, from time to time, wore them. I also wore one of them. They were taken out every night, and worn in every rain, from the time they were given in my charge up till the present day. They were worn all through the winter, through rain, snow, and sleet. I have put on a coat in heavy rains on purpose to test it. Have worn one of these coats in heavy rains, with nothing underneath but a white cotton shirt. Never noticed any disagreeable smell on these coats any more than any other Army clothes. They smell like petroleum-paper, in which the goods are packed. I never noticed any change in the color of the kersey. The coats are the same color now as when we got them. They appear to be as strong as ever they were; but they have been roughly handled, and may be weaker from wear and tear than a new coat. I do not think the stuff with which they are treated injures them in strength. As to their being water-repellent, I have, as I said before, worn them in heavy rains, and with nothing on under them except a cotton shirt, and I have never been wet. The coat gets wet, but the water runs down and drips off; but it don't go through the coat. One of the watchmen, who has left, named Samuel Leger, put on one of these coats and sat on a box and walked up and down for three hours in the heaviest storm we had last winter. I asked him why he got so much in the way of the rain, when he said he was bound to see if the coat was water-proof. When he took the coat off, at half-past twelve o'clock, when he was relieved from duty, he was perfectly dry underneath. I do not know whether they are moth-proof or not. The coats are always loose in the guard-house when not worn, and no pains were taken to protect them from moths.

JOHN FRYBURG.

Statement of SAMUEL PRICE.—I am one of the night-watch at the arsenal. About eight or nine months ago a lot of coats were given to the watchmen to try. They had been prepared by some party to make them water-proof. I have worn one of these coats ever since. We got them while I was on duty. I have been out with it in heavy rains—in fact, in every storm since I have had it. The coat kept me dry underneath; for, although the coat would get wet, the water would drop off. It don't soak the water and get soggy, like the Army coats. I have been in the Army myself, and think the way this coat is treated would be a good thing for soldiers in the field, and an improvement on the plain Army coat. I never noticed that there was any disagreeable smell about these coats. I don't notice that the coats are changed in color; they have been kicked about, and look a little dirty. They smell a little; but no more than any other goods. They smell of petroleum-paper, but I find no other smell about them. I don't know that they are any weaker in strength than any other coats; if they are I did not discover it. I don't know whether the moths will eat them or not. I didn't take any steps to keep them from doing so.

SAMUEL PRICE.

Statement of ROBERT McFEETERS.—I am one of the night-watchmen at the arsenal. About last October a lot of coats were sent to the guard-house to be tried. I was told that these coats had been put through some kind of a process to make them water-proof. Samuel Price and myself wore the same coat, because I relieve Price, and we wear the same coat. I have worn this coat in very heavy rains. It would get very heavy with water, but would let no water through. I have worn no other coat since this one was given to me; have had it in all kinds of storms, and my clothes never even get damp; in fact, I never saw the coat wet through. I can't say that I ever found any bad smell about the coat, any more than any other clothes packed up in boxes. If there was any bad smell, it soon left when the coat was exposed to the air; but I do not remember that there was any smell. I never noticed that it changed any in color after I had received it; nor do I think it was injured in any way in strength.

It is a good strong coat to-day. I do not know whether it is proof against moths or not; it has been hanging up in the guard-house when not in use, and no steps taken to keep moths from getting at it. I am of the opinion that these coats are an improvement on the old Army coat, because I have worn a great-coat in the Army. I would like to have it myself.

ROBERT McFEETERS.

Statement of LEWIS H. SWEENEY.—I am one of the night-watchmen. About nine months ago a lot of coats were given to the night-watch, to try whether or not they were water-proof. These coats had been put through some process, we were told, that would make them water-proof. We commenced to wear the coats from the time that

we got them; and I wore mine through all the rains during last fall and winter. One very heavy rain, the heaviest for a long time, when one of the sheds blew down, I was out in for three hours. The rain ran off the cape and off the bottom of the coat, but did not go through. I was perfectly dry underneath. I have been wearing the coat in stormy weather all the time since I have had it. I have never found any disagreeable smell about the coat, nor do I think that the color has changed in any way since I received it. I do not notice that the material is in any way weaker than when it was first made.

The coat to-day is, in my opinion, as strong as ever it was. I know nothing as to the moth-repelling qualities of the preparation. The coats have been used so much that moths could hardly have any chance to eat them.

LEWIS H. SWEENEY.

Statement of MARTIN C. COURTNEY.—I am one of the night-watchmen. I was not present at the examination of Mr. Sweeney. I am his partner on the watch, and we wear the same coat. Mr. Collins read to me carefully what Sweeney had said, and I agree with him in every particular.

MARTIN C. COURTNEY.

Statement of ISAIAH SMITH.—I am one of the night-watchmen. About nine months ago a lot of coats were given to the watchmen to be worn on duty. We were told that they had been prepared by some parties to make them water-proof. One of these coats was given to me, and I have worn it ever since, in all kinds of weather, while on duty. I have had it in the hardest kind of rain, and it kept me perfectly dry. I have worn all kinds of coats in my time, but have never seen anything equal to this one for keeping out the wet. I never noticed any disagreeable or unpleasant smell about the coat since I have worn it; nor have I noticed that it changed in color. I do not think that the coat is in any way injured by this treatment. The coat is now good and strong, although it has been pretty roughly used by Thos. Patterson and myself. I think it is a great improvement on the old Army coat, from my experience in the Army. I know nothing as to its being a moth-repellent. We tried it only as to water. The coat has, when not in use, been hanging up in the guard-room, and no means taken to keep moths away from it.

ISAIAH SMITH.

Statement of CONRAD MILLER.—I am one of the night-watchmen. Somewhere about eight months ago a lot of coats were given to the watchmen, to be worn in rain and storms. We were told that they had been fixed up by somebody so that they would keep out water. I have worn the coat I got all kinds of storms, through the winter and spring, and on up to now. I wore no other coat while I was on duty since I had it. The coat kept me perfectly dry in the rains and snows. Never noticed any bad smell about the coat since I have had it. I have not noticed that it changed any in color since I have had it. Do not think that the kersey is in any way injured by the treatment of this Water-proofing Company. The coat now appears to be new and strong. Don't know anything about moths eating coats prepared in this way. I think this coat is a great improvement, as far as keeping out water is concerned.

CONRAD MILLER.

Statement of THOMAS H. PATTERSON.—I am one of the watchmen at the arsenal. About eight months ago a lot of coats, that had been prepared by some company, so we were told, were given to the watchmen to wear, and see if they were water-proof. One of these coats was given to me and Smith, and we both wore it while on duty since that time, in all kinds of weather, and it always kept me dry. I was not present while Smith was being examined; but I have heard his statement read, and can indorse every word of it.

THOMAS H. PATTERSON.

Statement of JOHN CROSS.—I wore the same coat while on duty that Conrad Miller did. I was not present when he was examined; but have heard his statement read, and can indorse what he says. I will say for myself that if I had the choice of a coat for my own wear, I would take one of this kind.

JOHN CROSS.

Statement of C. EDWARD MILLER.—I am one of the night-watchmen at the arsenal. I have worn one of the great-coats treated by the company who have the water-repelling process. I have not worn it as constantly as the other workmen, from the fact that I am stationed at the front gate of the arsenal. I have, however, worn it very frequently, and in very heavy rains. On one occasion I wore it, with scarce a half-hour's intermission, all through the night, and during the prevalence of a very heavy rain, and was kept perfectly dry. I never found any disagreeable smell about, more than that from the box in which packed; nor have I noticed any change in color; nor do I think the process has a tendency to weaken the goods. I have seen moths around the little room in which we have our clothes; but have not been able to discover that the coat has been in any way damaged by them.

C. EDWARD MILLER.

Statement of SAMUEL CLARKE.—I am one of the night-watchmen at the arsenal, stationed at the front gate with Miller. I have worn one of the coats treated by the Water-proofing Company, the same one worn by Miller. Have, on several occasions, been exposed to very heavy rains, and have been kept perfectly dry underneath. Never noticed any bad smell about the coats, other than that of petroleum-paper, in which they had been packed. They keep wet for some time, but the water does not go through. Don't know that the process weakens the goods. Have plenty of moths in our little room where we keep our clothes; but I have not seen any moth-holes in the coat.

SAMUEL CLARKE.

Reports from the various Army posts.

The following reports are from officers in charge of clothing and equipage in the various Army posts, and were before the board, as a portion of the evidence upon which they formed their report. Some reports were of an unfavorable character; but, as is stated by the board, an investigation by the Quartermaster-General, in every instance, proved these unfavorable reports to have been based upon a mistake in the officers making them. In every instance, it was shown that the clothing reported upon unfavorably had not been subjected to the process of George A. Cowles & Co. In all the various Army posts, no clothing or canvas, which it was shown had been subjected to the process of Cowles & Co., has failed to give the fullest satisfaction in all respects.

WEST POINT, NEW YORK, *May 25, 1872.*

MAJOR: In reply to your letter of the 23d instant, I have the honor to inform you that the prepared clothing sent me from Philadelphia depot, February 6, 1872, is, so far as I have observed, moth-repellent. My opportunity for observing is this: The clothing has been stored ever since its receipt in the same room (a large store-room, occupying the entire upper-story of the engineer barrack, at this post) with some of the old clothing.

The latter is much injured by moths, while the new clothing is not at all so. No objections have been made to wear it by the enlisted men.

On the contrary, it is in great demand, as heavier and wearing better.

Very respectfully, your obedient servant,

O. H. ERNST,

Captain Corps of Engineers, Commanding Company "E," Battery Engineers.

Major J. D. BINGHAM,

Quartermaster United States Army, Washington, D. C.

OFFICE OF THE ACTING ASSISTANT QUARTERMASTER,
Fort Wood, New York Harbor, May 27, 1872.

SIR: In reply to your communication of the 23d instant, in regard to the prepared clothing received at this post from the depot at Philadelphia, January 16, 1872, I have the honor to report, that until now no sign of moth is to be seen on those in the quartermaster's store-room, notwithstanding they are stored near some very old clothing. The prepared trousers issued to the men give universal satisfaction, if only on account of their color; as they are uniformly of better color than those on hand before them.

I am, sir, very respectfully, your obedient servant,

JNO. POPE,

Second Lieutenant, First Artillery, Acting Assistant Quartermaster.

QUARTERMASTER-GENERAL, UNITED STATES ARMY,

Washington, D. C.

OFFICE ACTING ASSISTANT QUARTERMASTER,
Fort Foote, Indiana, May 27, 1872.

GENERAL: In reply to your communication of the 23d instant, pertaining to prepared clothing, I have the honor to reply that, after an examination of the clothing, I found that no damage had been done to them by moths; and the clothing is not objected to by the enlisted men, no complaints having ever yet been made regarding them.

I am, general, very respectfully, your obedient servant,

FREDERICK FUEGER,
Lieutenant, Fourth Artillery, A. A. Q. M.

General M. C. MEIGS,
Quartermaster-General United States Army, Washington, D. C.

OFFICE ACTING ASSISTANT QUARTERMASTER, May 28, 1872.

SIR: In reply to your letter of the 23d instant, I would respectfully state that the articles of clothing, &c., forwarded me from Philadelphia, Pennsylvania, January 17, were not received till February 6, 1872; and in my inspection this month no evidences of moth were found in them. As my store-house is entirely free from moths, I do not feel that this invoice of clothing has been tested as to its moth-repellent properties.

The quality of this clothing is superior to any that has been received at this post for the past three years, and is not objected to by the men.

Very respectfully, your obedient servant.

GEO. W. DESHLER,
Second Lieutenant, First Artillery, A. A. Q. M.

The QUARTERMASTER-GENERAL, UNITED STATES ARMY,
Washington, D. C.

OFFICE ACTING ASSISTANT QUARTERMASTER,
Fort Washington, Maryland, May 31, 1872.

GENERAL: In reply to communication of 23d instant from your office to Lieutenant Everett, Fourth Artillery, referred by that officer to me, relative to prepared clothing, I have the honor to report that, as far as is known, the clothing was moth-repellent, none of the articles having been at all injured by moth, from their receipt here in March till their issue during the month of April. The time of observation was much shorter than could have been desired, so far as concerns their safety in the store-house. The men received them preferably to any other trousers. The color and material appear to be better than anything I have seen in a number of years in the way of Government clothing.

I am, general, very respectfully, your obedient servant,

M. C. GRIER,
First Lieutenant, Fourth Artillery, A. A. Q. M.

Brigadier-General M. C. MEIGS,
Quartermaster-General, United States Army, Washington, D. C.

OFFICE ASSISTANT QUARTERMASTER,
Brownsville, Texas, June 8, 1872.

SIR: In reply to letter of the 23d ultimo, from your office, relative to moth-repellent trousers, I have the honor to report that no objections whatever have been made by enlisted men to wearing the clothing; on the contrary, they speak in favorable terms of the quality and wear of the same.

Very respectfully, your obedient servant,

E. J. STRONG,
Captain and A. A. Q. M., Brevet Lieutenant-Colonel, U. S. A.

Brigadier-General M. C. MEIGS,
Quartermaster-General, United States Army, Washington, D. C.

POST QUARTERMASTER'S OFFICE,

Savannah, Georgia, June 29, 1872.

GENERAL: I have the honor to inform you that, agreeably to my letter of May 28, I have had exposed since that time one blouse and pair of pants, subjected to the action of the "water-repellent and mildew-preventive," received with the clothing invoiced me from Philadelphia depot March 22, 1872.

On examining the articles, which have been exposed for the last thirty-one days, I find to-day that they are in the same condition as when received from Philadelphia, and entirely uninjured by moth.

I am, general, very respectfully, your obedient servant,

C. A. H. McCAULEY,

Second Lieutenant, Third Artillery, A. A. Q. M.

Brigadier-General M. C. MEIGS,

Quartermaster-General, United States Army, Washington, D. C.

DEPOT OF ARMY CLOTHING AND EQUIPAGE,

Jeffersonville, Indiana, July 2, 1872.

GENERAL: Herewith I have the honor to forward a sample each of duck (prepared and unprepared) which have been submitted to an equal test as to mildew-preventive qualities since my report of the 15th ultimo. These samples present more clearly the virtues of the preparation than those previously sent; hence my forwarding them.

They were kept saturated for seventeen (17) days, and the results show that the preparation has entirely resisted mildew for a period in which the unprepared duck has become completely rotten.

I am, general, very respectfully, your obedient servant,

JOHN T. RODGERS,

Captain and Military Store-keeper, United States Army.

Brigadier-General M. C. MEIGS,

Quartermaster-General, United States Army, Washington, D. C.

OFFICE OF THE POST QUARTERMASTER,

Louisville, Kentucky, July 20, 1872.

GENERAL: In compliance with directions relative to the merits of trousers rendered water-proof and proof against damage by moths, I have the honor to report, that after a fair trial they are found to be thoroughly moth-proof, but not quite water-proof. The quantity of the material is found to be superior than that heretofore issued.

Very respectfully, your obedient servant,

HENRY J. HOWLAN,

First Lieutenant and R. Q. M., Seventh Cavalry, A. A. Q. M., United States Army.

The QUARTERMASTER-GENERAL,

Washington, D. C.

LIGHT BATTERY F, FIFTH ARTILLERY,

Fort Adams, Rhode Island, September 4, 1872.

GENERAL: In reply to your communication of June 27, 1872, I respectfully report, that the new-pattern mounted trousers sent to this battery for trial have given the greatest satisfaction. The cloth is found to be firmer, and wears better, while the outlets in the seams enable the trousers to be altered to fit the wearer, without his being compelled to draw a size much too large, so that it can be cut down.

No objectionable odor or injury to the fabric has been observed to result from the process to which they have been submitted to render them moth-repellent.

Very respectfully, your obedient servant,

H. A. DUPONT,

Captain, Fifth Artillery, Commanding Light Battery F.

Brigadier-General M. C. MEIGS,

Quartermaster-General, United States Army, Washington, D. C.

HEADQUARTERS TROOP B, SEVENTH CAVALRY,
Post of Spartanburgh, Spartanburgh, S. C., September 30, 1872.

SIR: In compliance with instructions received from you through the acting assistant quartermaster of this post, dated April 24, 1872, requesting officers to whom water and moth proof trousers and mildew-proof tents have been issued to report, after a fair trial, the merits of the same, I have the honor to state, that in my opinion the water and moth proof trousers are superior to the old issue. The mildew-proof tents have been in use since the 1st of May, 1870; and I also consider them a great improvement on the old style, as being what they are recommended to be—water and mildew proof.

I am, sir, very respectfully, your obedient servant,

WM. THOMPSON,

Captain, Seventh Cavalry, Commanding Troop B.

The QUARTERMASTER-GENERAL, UNITED STATES ARMY,
War Department, Washington, D. C.

POST QUARTERMASTER'S OFFICE,
Fort Hays, Kansas, November 19, 1872.

SIR: In compliance with note expressed on invoice of Captain John Livers, military store-keeper, United States Army, dated Fort Leavenworth, Kansas, October 11, 1872, I have the honor to report to you that the one (1) bale of 200 pairs of trousers, mentioned on said invoice, subjected to the water-repellent, moth and mildew preventive of Messrs. Cowles & Co., were opened for issue about October 24, 1872, and found to be in excellent condition, and have continued so up to this date.

Very respectfully, sir, your obedient servant,

FRANCIS B. JONES,

First Lieutenant, Third Infantry, A. A. Q. M.

The QUARTERMASTER-GENERAL, UNITED STATES ARMY,
Washington, D. C.

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EXAMINATION OF CANDIDATES FOR CLERKSHIPS IN THE
NAVY DEPARTMENT.

LETTER

FROM

THE SECRETARY OF THE NAVY,

RELATIVE TO

The questions propounded by the examiners to the candidates for appointments and promotions to clerkships in the Navy Department.

FEBRUARY 8, 1873.—Referred to the Committee on the Re-organization of the Civil Service of the Government and ordered to be printed.

NAVY DEPARTMENT,
Washington, January 31, 1873.

SIR: I have the honor to furnish herewith, in compliance with a resolution of the House of Representatives adopted on the 27th instant, a "copy of all the questions propounded by the examiners to the candidates for appointments and promotions to clerkships" in the Navy Department.

Very respectfully, &c.,

GEO. M. ROBESON,
Secretary of the Navy.

HON. JAMES G. BLAINE,
Speaker of the House of Representatives.

EXAMINATION No. 1.

Promotion.—Clerkship of Class Two.—Bureau of Provisions and Clothing, December 14, 1872.

PRELIMINARY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?

5. State briefly as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you are now employed, and the character of the duties you perform.

ARITHMETICAL.

9. Write in figures the following numbers:

Thirty-two thousand and sixty.

Four millions two thousand and six.

Six hundred and one millions, twenty-five thousand, three hundred and one, and decimal eleven hundred thousandths.

10. Write at length the numbers expressed by following figures:

301,500.

231,607,005.

506.0025.

249,064.00001.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains:

37,640,787	95
109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14

37,640,787	95
109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,880	82
149,004	15
175,111	81
193,636	59
269,803	41
315,022	36
205,217	87
379,558	23
384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47

Show the operation at length in each case.

12. The standard gold dollar of the United States contains nine parts of pure gold and one part of alloy, and weighs 25.8 grains troy. How many grains of gold and alloy, respectively, are required for the coinage of 6,983 gold dollars?

13. The Ordnance Department sold at public auction 12,750 condemned Springfield muskets, at \$12.37½ each, the original cost of which was \$14.75 per piece; 3,075 sabers, at \$3.87½ each, which cost \$5.31½ per piece; and 100,000 rounds of cartridges for \$5,000, the original cost being \$1.25 per 100 rounds. What was the total original cost, and what was the amount realized?

(Give the operation and result in common fractions.)

14. The duty on spool thread of cotton, containing 100 yards to the spool, is 6 cents per dozen spools, and in addition thereto 30 per cent. *ad valorem*, (or upon the value.) What is the amount chargeable on 11,153 spools, valued at 3 cents a spool?

15. A transport was hired to carry 315 tons of Government stores from New York to Charleston, at the rate of \$3.3125 per ton per month. The vessel left New York at 2 o'clock a. m., August 16, 1871, and reached Charleston on the 21st of the same month at 11 o'clock a. m. How much pay was due, allowing 30 days to the month?

(Give the operation and result in decimal fractions.)

16. What time is required for \$25,250.00 to gain \$5,162.22½, at the rate of 8 per cent. interest *per annum*, reckoning 360 days to the year?

17. A paymaster made the following payments to the regiments of a brigade, to wit: To the first regiment, \$10,000; to the second, \$9,500; and to the third, \$8,575.62. Of these amounts \$2,500, \$2,275, and \$1,850 were, respectively, suspended for informalities in the vouchers. What was the per cent. of suspensions on each payment and on the total amount paid?

18. Calvin Hale pays \$7,350 in currency for Indian goods worth \$6,345 at gold prices. What is the premium on gold; what is gold worth in currency; what is currency worth in gold?

19. John Smith is a disbursing agent of the United States. January 1, 1872, there is in his hands \$11,870.63; February 1, he pays out \$3,220.34, on which he is entitled to a commission of $1\frac{1}{2}$ per cent. March 1, he receives \$3,750.87; May 1, he pays out \$4,763.82, on which he is entitled to a commission of $2\frac{1}{2}$ per cent.

Make a statement of his account in the frame beneath, showing balance due the United States.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

20. Where was the first permanent English settlement made in the United States?

21. Name the thirteen original colonies.

22. When was the second war between this country and Great Britain declared, and for what reason?

23. Is the President authorized ever to adjourn both Houses of Congress, and if so, under what circumstances?

24. How may the Constitution be amended?

25. In the following list, state which are sea-ports and which inland cities; Albany, Charleston, (S. C.,) Raleigh, Atlanta, Savannah, Portland, and Hartford.

26. What rivers unite and form the Ohio?

27. What are the principal tributaries of the Mississippi River?

ORTHOGRAPHY AND PUNCTUATION.

28. Copy the following passage clearly and legibly, correcting mistakes of orthography and punctuation, but not otherwise altering either the words or their order:

the infleunce of printing upon the english landgwide has bin much extended and strengthened by to important sircumstances comon to thee two grate countrys of whitch it is the virnackuler the one is that in neather does their. Exist nor for senturies has thare existed a sencership of the Press a previus orthoritative examina-shun of manuskript matter intendid for The Publick;—the other is that publick dis-kussion of all questions in the departments of religion of intelectual and morral filos- ofy of Pollyticks indede; of awl topics afecting the grate and purminant interests of man; is free and unrestricted hence the populer mind the populer speach in both countries are open to a class of infleunces whitch in moste Continentle Staits are confined to the priviledged and professsional alone.

SYNTAX.

29. Copy the following sentences, and correct the errors in syntax:

The rapidity of his movements were beyond example.

The wall is ten foot high.

I have neither Johns or Williams' book.

Which of those two cords is the stronger?

Who did you go with?

The sight appeared terrible to me.

I can learn him many things.

He done me no harm, for I had wrote my letter before he come home.

LETTER AND BRIEF.

Upon completing the letter the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the Board of Examiners, and fold and brief your reply:

1. What supplies for the Navy, if any, do not have to be procured by contract, after advertisement, with the lowest bidder?

2. Who cannot be received as sureties on a contract for naval supplies?

3. What is the difference between a commission and a warrant, as issued to officers of the Navy?

4. How are naval appropriations of a Bureau drawn from the Treasury?

5. What is the commutation price of the Navy ration?

6. What is the period of enlistment for seamen, and what for marines?

7. With what description of guns are our ships-of-war generally armed?

8. Is a paymaster, in the issue of stores, required to issue them at cost, or is he allowed to add a percentage to cover any loss?

9. If, on examination of a paymaster's returns, it is found that certain articles of clothing or small-stores are unaccounted for, what action is taken in the matter?

EXAMINATION NO. 1.—FOR ADMISSION, JANUARY 13, 1873.

BUREAU OF PROVISIONS AND CLOTHING.

Clerkship of class one.

NOTE.—The signature of the candidate to be annexed. Answers to be given opposite or under the questions. The operation in the examples must be shown in full in each case.

1. Name?
2. Residence?
3. Place and date of birth?
4. Brief statement as to your education?
5. What experience in business or profession?
6. What clerical or other experience in Government service?

ARITHMETICAL.

7. Write in figures the following numbers: Twenty-four millions and six, and decimal forty-two thousandths. Nine hundred and six millions, two hundred thousand and one, and decimal six hundred thousandths.

8. Write in words the numbers expressed by the following figures:

2,308.3051.

.97500.

9. Express in decimal form by figures: $7\frac{17}{100000}$.

10. Express by figures: Seventy-nine million two thousand, and six hundred five-thousandths. Ten thousand five hundred and five millionths.

11. Add the following column of figures:

\$37,640,787 95
109,741,134 10
209,464,215 25
309,226,813 42
266,027,537 43
* 191,087,589 41
158,356,460 86
311,533 83
194,572 32
24,709 46
118,248 30
92,718 50
150,476 14
103,880 82
149,004 15
175,111 81
193,636 59
269,803 41
315,022 36
205,217 87
379,558 23
384,720 19
445,485 18
464,546 52
427,124 98
337,032 62

12. Multiply the following figures:

\$896,745 54
726,047 86

13. Give in figures the difference between the above two results.

14. A clerk agreed for a house as follows: To pay the contractor 3 per cent. profit on the cost of the materials, and $4\frac{1}{2}$ per cent. profit on the cost of the labor, and was, himself, to be allowed $3\frac{1}{2}$ per cent. on the total cost of the materials and labor in consideration of prompt cash payment. The materials used were 132,000 bricks, at \$12 54 per

HISTORY, GOVERNMENT, AND GEOGRAPHY.

20. When and where did Washington resign his commission?
21. Where, and in what year, was the United States frigate Chesapeake boarded by the Leopard for the impressment of seamen?
22. The United States are now in what year of their independence?
23. When did the Constitution of the United States go into operation?
24. What is treason against the United States, and what is necessary to convict a person thereof?
25. In choosing a President of the United States by the House of Representatives, how many votes would the State of New York be entitled to?
26. Through what States would a line pass if drawn directly from New York to New Orleans?
27. Name the States and Territories of the United States bordering on Mexico?
28. Where is the island of St. Helena?

SYNTAX.

Write out the following sentences, making any corrections that may be necessary:

29. Who servest thou under?
30. All friendship between you and I are severed.
31. Every one should know his duty.
32. Is that him who you were speaking of?
33. Your note, with its inclosures, have been referred to the Bureau, agreeable to your request.
34. The ship rode out the storm beautifully.
35. Neither your letter or its accompaniments have any bearing on the subject.
36. I speak now of John Q. Adams, the greatest orator of the two, he who died in the Capitol.
37. If thy hand or thy foot offend thee, cut them off and cast them from thee.

ORTHOGRAPHY AND PUNCTUATION.

Copy the following passage clearly and legibly, correcting mistakes of orthography and punctuation, but not otherwise altering either the words or their order:

38. There is however a much more palperble violation of gramar. In the use of the virb was it falls uppon a grammatical ear like a hiddeous discord in waying such expresions. We must devest ourselves off evry vestage of revverance; for meer names poets orraters historyans critticks when throne into the grammatical crusabel come out simply as men. Striped off all adventicious ornaments you was insted of you ware in point of perpriaty stands on a parr with thou ware the orthoraty of addison. In maters of grammer of bentley who evadently never made english gramer his studdy of bolingbroke pope and others is as nothing nothing short of unaversel addoption before which all must bow can evver sancsion the expresion. You was, it can find no refuge but in ignorence or silley efectacion.

LETTER AND BRIEF.

39. Henry L. Bell, a member of the House of Representatives, writes, under date of December 6, 1872, to the Secretary of the Navy, recommending Thomas Lyons for a clerkship in the Navy Department.

You are required to draw up, for the signature of the Secretary of the Navy, a courteous, official reply, embodying the following points: Vacancy exists; why Mr. Lyons cannot be appointed; inclose civil-service rules and instructions for applicants; state when examination will take place, (fixing date yourself,) and the latest date at which applications for examination can be received, (allowing an interval of two weeks,) and refer him to inclosures for further information.

Fold the sheet, and indorse subject of inquiry and the answer in brief.

QUESTIONS IN CIVIL-SERVICE EXAMINATIONS IN THE
POST-OFFICE DEPARTMENT.

LETTER

FROM

THE POSTMASTER GENERAL,

RELATIVE TO

*The questions propounded by the examiners to candidates for appointments
and promotions in his Department.*

FEBRUARY 8, 1873.—Referred to the Committee on the Re-organization of the Civil
Service of the Government and ordered to be printed.

POST-OFFICE DEPARTMENT,
Washington, D. C., February 3, 1873.

SIR: I transmit herewith, in compliance with the resolution of the
House of Representatives of January 27, 1873, a copy of all the ques-
tions propounded by the examiners to candidates for appointments and
promotions in this Department.

Very respectfully, your obedient servant,

JNO. A. J. CRESWELL,
Postmaster-General.

HON. JAMES G. BLAINE,
Speaker of the House of Representatives.

*Copy of the questions used in competitive examinations held in the Post-
Office Department, under the rules and regulations for the civil service.*

LETTER-WRITING AND BRIEFING.

Examination for admission. Date of examination, July 15-19, 1872.

Write a letter addressed to the Postmaster-General, containing such facts in regard
to yourself as you desire to make known. Fold the letter and write on the back a
summary of the contents.

Examination for promotion. Date of examination, July 30, 1872.

Address a letter to the Postmaster-General upon the organization of the Post-Office
Department, and describe the duties belonging to the several bureaus, as far as your
acquaintance with such duties extends. Your proficiency in orthography and punctua-
tion will be determined principally by that letter; though errors in those branches, in
any part of the examination, will also be taken into account.

Examination for admission. Date of examination, September 30, October 1 and 2, 1872.

Address a letter to the Postmaster-General, stating where and when you were born, what educational advantages you have had, what business you have been engaged in, and such other facts in regard to yourself as you may desire to communicate. Sign the letter with your full name; give your post-office address; fold the letter and write on the back a brief or summary of the contents.

Examination for promotion. Date of examination, December 18, 1872.

Address a letter to the Postmaster-General, upon the organization and duties of the Office of the Second Assistant Postmaster-General. Describe what duties belong exclusively to the contract division, and what to the inspection division of that Bureau. State in what branch of the Office you have been employed, and for what length of time; what your particular duties are, and, briefly, what knowledge you have of the organization and duties of the Department generally. Fold the letter in the usual official manner for filing, and indorse on the back a summary of the contents.

Examination for promotion. Date of examination, January 7, 8, and 14, 1873.

Address a letter to the board of examiners, stating when and where you were born; of what State you are a citizen; what educational advantages you have had; what business or occupation you were engaged in before your appointment to a clerkship in the Post-Office Department; how long you have been in the Department; in what branch of it you are employed, and the nature of the duties upon which you are engaged. Fold the letter in a proper manner for filing, and write on the back of it your name, the date, and a brief of the contents.

Examination for promotion. Date of examination, January 13, 1873.

Address a letter to the Postmaster-General, upon the organization and duties of the Office of the Third Assistant Postmaster-General. State in what branch of the Office you have been employed, and for what length of time; what your particular duties are, and, briefly, what knowledge you have of the organization and duties of the Department generally. Fold the letter in the usual official manner for filing, and indorse on the back a summary of the contents.

Examination for admission. Date of examination, January 15-18, 1873.

Address a letter to the board of examiners, stating any facts you may desire to communicate in regard to yourself; fold the letter, and write on the back a brief or summary of its contents.

GRAMMAR.

Examination for promotion. Date of examination, June 17, 1872.

State, in your own words, briefly, the nature and object of punctuation.

Correct the punctuation of the following extract:

"Men of superior genius; while they see the rest of mankind, painfully struggling, to comprehend obvious truths; glance, themselves, through the most remote consequences; like lightning through a path, that cannot be traced; they see the beauties of nature, with light and warmth, and paint them forcibly, without effort; as the morning sun, does the scenes he rises upon; and in several instances communicate to objects, a morning freshness, and unaccountable luster, that is not seen in the creations of nature, the poet, the statuary, the painter; have produced images that left nature far behind."

Correct the following sentences:

He entreated my companion and I to live harmonious.

Associate not with those who none can speak well of.

I intended to have answered your letter yesterday.

The court of chancery frequently mitigates and breaks the teeth of the common law.

ORTHOGRAPHY AND PUNCTUATION.

Examination for admission. Date of examination, July 15-19, 1872.

Write out the following extract; correct the defective spelling, and insert the proper punctuation marks. The paragraphing is defective; correct what is erroneous in that particular:

In the grate skale of Society there is a continued rise from one Excelence to another Excelence internal or external, intelectual and morale.

Wherever we may fix there is still some one whom we may find Superior or Inferior and these Relations are mutually convertible as we ascend or descend the Shrub is taller than the Flower which grows in its Shade The Tree than the Shrub the Rock than the Tree the mountain than the single Rock and above all the Sun and the Heavens it is the same in the World of Life.

From that all mighty being who is the Source of Life to the lowest of his Creatures what innumerable gradations may be traced even in the Ranks of Excellence on our own Earth each being higher than that beneath and lower than that above.

And thus all to all objects at once of Pride or Humility according as the comparison may be made with the Greater or the Less.

GRAMMAR.

Examination for admission and promotion. Date of examination, July 15-19, 1872, and July 8, 1872.

1. What is a sentence?
2. What is the difference between a simple and a compound sentence?
3. In the following sentences, what part is the predicate and what the nominative?

"The roses were in bloom."

"The air, the earth, the water, teem with delighted existence."

4. What is the meaning of the term "case," as used in grammar? Give the answer in your own language.

Correct such of the following sentences as are defective; write them as they should be expressed:

5. He died with violence being killed by a sword.
6. He was so ill that he could not set up at all, but had to lay in bed all the time.
7. What we do secret shall be seen and heard in the clearest light.
8. Many act so directly contrary to this method, that from a habit of saving time and paper, which they acquired at college, they write so little that they can hardly read it themselves.
9. On receiving this information, he arose, went out saddled his horse, mounted him and rode to town.
10. They begin to extol the farmer's, as they call him, excellent understanding.
11. Genius lies buried on our mountains and in our valleys.
12. The latest posterity will listen with as much, or even greater pleasure than their contemporaries.
13. Man is not such a machine as a clock or a watch, which move merely as they are moved.
14. Much depends upon this rule being observed.
15. I wish to cultivate a further acquaintance with you.
16. The covetous man never has a sufficiency; although he has what is enough for nature.*

Examination for promotion. Date of examination, July 30, 1872.

What is a finite verb?

What is meant by the voice of a verb?

In what voice is the verb in the sentence, "The pitcher was broken at the well?"

Of how many words may a verb consist?

What are the principal parts of a simple sentence?

What is meant by concord and government, as used in grammar?

Write the following sentences, taking care to correct, in so doing, every error you may discover. [Some of these sentences contain violations of the rules of syntax; some are defective as regards perspicuity and accuracy of expression, and others are redundant, deficient, or improperly arranged in regard to the relation of words or members.]

Some men think exceedingly clearly, and reason exceedingly forcibly.

The history of Peter is agreeable with the sacred texts.

This dedication may serve for almost any book, that has, is, or shall be published.

I feared that I should have lost it before I arrived at the city.

I had rather walk than ride.

Hope, the balm of life, darts a ray of light through the thickest gloom.

When favors of every kind are conferred speedily, they are doubled.

These arts have enlightened, and will enlighten, every person who shall attentively study them.

* Nos. 1-12 of this series, numbered in red, used in examination for promotion, July 13, 1872.

Nos. 5, 6, 7, 8, 10, 11, 12, 13, 14, and 16, used in examination for promotion, January 13, 1873.

We were at the fair, and saw everything there.

Never did man succeed better in gaining the universal love and esteem of all men.

There can be no doubt but that he seriously means what he says.

I am honestly, truly, seriously and unalterably of opinion, that nothing can possibly be more incurably and emphatically dangerous and destructive, or more decisively fatal, to a kingdom, than the introduction of thoughtless dissipation, and the proud pomp of lazy luxury.

Though energetic brevity is not adapted alike to every subject, we ought to avoid its contrary, on every occasion, a languid redundancy of words. It is proper to be copious sometimes, but never to be verbose.

Examination for admission. Dates of examination, September 30, and October 1 and 2, 1872.

Arrange the words in the following sentence under appropriate headings, designating the part of speech to which each word belongs :

"The power of speech is a faculty peculiar to man, and was bestowed upon him by his beneficent Creator for the greatest and most excellent uses; but alas! how often do we pervert it to the worst of purposes."

What is a participle?

Examination for admission. Dates of examination, September 30, and October 1 and 2, 1872.—Examination for promotion. Dates of examination, December 18, 1872, and January 14, 1873.

Write the following sentences, taking care to correct, in so doing, all the errors you may discover; if you do not detect any, say so, without rewriting the sentence:

Him and me belongs to the same club.

That is the person whom we think deserves the reward.

His brother-in-laws were educated at the same school.

Fusion is where a solid is converted into a liquid by heat.

The lot is 25 foot front and 8 rod deep.

Will it be urged that these books are as old, or even older than tradition?

There was a chance of him recovering his senses.

If any member of the congregation wish to connect themselves with this church, they will please come forward while the brethren sings.

Examination for promotion. Dates of examination, January 7 and 8, 1873.—Examination for admission. Dates of examination, January 15-18, 1873.

Rewrite the following sentences, taking care to correct, in so doing, all the errors, of whatever kind, you may discover in them. If you do not detect any, say so, without copying the sentence:

We were all sitting round the fire.

I expect it rained last night.

I seen the limb tore off.

To refrain from luxuries is better than going in debt for them.

Knowing him for many years, I confidently recommend him.

He knew not which to most admire.

Thought and language act and re-act upon each other mutually.

How can I distinguish the good from bad?

In England, every one is free as soon as they touch the land.

The British constitution stands, like an ancient oak in the woods, among the nations of the earth, which, after having overcome many a blast, overtops the other trees of the forest, and commands respect and veneration.

ARITHMETIC.

Examination for promotion. Dates of examination, July 8 and 13, 1872, and January 13, 1873.

(Give the work in full, and before the answer write plainly, *Answer*.)

Multiply the sum of $2\frac{7}{8}$ and $1\frac{1}{2}$ by their difference, and express the result decimally.

What decimal part of a year is $9\frac{1}{2}$ months?

A note of \$680, being on interest at 4 per cent., amounted to \$727.60; how long was it on interest?

What is the discount, at 6 per cent. per annum, on \$172.86, due 3 years and 4 months hence?

The pay on a certain route is \$2,525.53 per annum, and the whole distance 89 miles; there is 6 times a week service on 27 miles, 3 times a week on 45 miles, and twice a week on 17 miles: how much additional per annum will it cost, *pro rata*, to double the 3 times a week service?

What per cent. of the original cost would the *pro rata* for the increased service be in the above case?

If, on the same route, the semi-weekly service should be discontinued, what sum would be saved, and what per cent. would that sum be of the original pay?

What difference is there between the *interest* of \$2,260, at 6 per cent. per annum, for 5 years, and the *discount* of the same sum for the same time and rate per cent.?

Examination for promotion. Date of examination, June 17, 1872.

If $\frac{3}{4}$ is the numerator of the following fraction, $\frac{\frac{3}{4}}{\frac{1}{2}}$, what is its value when reduced to a simple fraction?

P. Thomas had \$8,000; he gave 19 per cent. of it to his wife, 37 per cent. of the remainder to his sons, and \$2,000 to his daughters; what had he left?

What principal will gain \$5.11 in 3 years and 6 months at 9 per cent.?

What is the bank discount on \$478 for 60 days?

Examination for admission. Dates of examination, July 15-19, 1872.

Put down in figures, one hundred and nine millions eight hundred and seventy-six thousand five hundred and forty-three.

Write in words 127894237867.

Add up the following figures and give the amount:

126798642785
762423954723
546278627482
154327562741
243462746567
421654326541
268427314267
186324627472
347421342614
614347421342
541798954421
785724642302
204604234212
348247362123
326142302203
412312217205
212162401307
121242310217
241647267118
912423217409

Multiply 8010700 by 9000909.

Divide 345678901765 by 4007.

Examination for admission. Dates of examination, July 15-19, 1872.—Examination for promotion. Date of examination, July 30, 1872.

Add $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{6}{7}$, and $\frac{7}{8}$.

Subtract $\frac{1}{11}$ from $\frac{1}{11}$ of $\frac{1}{11}$.

Multiply $\frac{1}{17}$ by $\frac{1}{6}$.

Divide $\frac{1}{4}$ by 9.

Divide $\frac{1}{8}$ by $\frac{2}{3}$.

Add 151.01, 611111.01, 16.5, 6.7, 46.1, and .67896.

Multiply 47.01 by 047.

Divide 9811.0047 by .108649.

Divide 13 by $\frac{3}{4}$.

The nominal value of a share in B. & M. R. R. is \$100; if I purchase 17 shares at 15 per cent. below the nominal value, and sell them for 15 per cent. above, what do I gain?

What is the interest of \$1,165.50 for 5 years, 3 months, and 9 days, at 7 per cent. per annum?

How long must \$98 be on interest, at 8 per cent., to gain \$25.48?

A note of \$500, being on interest 2 years and 6 months, amounted to \$550; what was the rate per cent.?

S. Jones gave his note for \$375.75, dated October 4, 1842, payable to J. Wills, or order, January 1, 1844; what was the value of the note at the time it was given?

On a route 85 miles long, there is, on 28 miles, 6 times a week service; on 37 miles,

* This example used only July 30, 1872.

3 times a week service, and on 20 miles, twice a week service. The pay for the whole service is \$2,871 per annum. What sum would be saved by making the service 3 times a week over the whole route, at *pro rata* deduction of pay?

Examination for admission. Date of examination, September 30, and October 1 and 2, 1872.—Examination for promotion. Date of examination, January 14, 1873.

Add up the following figures, and, in your answer, give the amount only:

10392280
6206606
5385652
911793
3414238
8869751
30123614
2072069
9535663
200712
1036433
2944660
2609239
2698313
1291366
1708356
1630100
834341
1904370
1055085
5808021
1525794
2025520
783768
293608

Examination for admission. Date of examination, September 30, and October 1 and 2, 1872.—Examination for promotion. Date of examination, December 18, 1872, and January 14, 1873.

Add up the following numbers, and in your answer give the entire work:

Three and eighteen ten thousandths; one thousand five, and twenty-three thousand forty-three millionths; eighty-seven, and one hundred seven thousandths; forty-nine ten thousandths; forty-seven thousand, and three hundred nine hundred thousandths.

Write out in words the following figures:

30316710. 2345678

Examination for admission. Date of examination, September 30, and October 1 and 2, 1872.—Examination for promotion. Date of examination, December 18, 1872.

In your answer to the following questions give the work in full, and opposite the answer write plainly, *answer*. Common fractions must in all cases be reduced to their lowest terms, and decimals, where there is a remainder, must be carried out to four places at least.

Divide seventy-five, and sixteen hundredths, by five, and forty-two thousand eight hundred one hundred thousandths.

A man purchased a house and lot for \$10,000, on the following terms: \$5,000 cash, \$2,500 in three months, and the balance in six months; what was the cash value of the property, interest being reckoned at 6 per cent.?

Examination for admission. Date of examination September 30, and October 1 and 2, 1872.—Examination for promotion. Date of examination, December 18, 1872, and January 14, 1873.

Add $\frac{1}{3}$ of $\frac{3}{4}$ of $\frac{1}{2}$, to $\frac{1}{2}$ of $\frac{2}{3}$.

Examination for admission. Date of examination, September 30, and October 1 and 2, 1872.—Examination for promotion. Date of examination, December 18, 1872.

If a yard of muslin be bought for $37\frac{1}{2}$ cents, and sold again for 32 cents, what is the loss per cent.?

If \$1,000, at $4\frac{1}{2}$ per cent. per annum, amounts to \$1,281.25, how long was it at interest?

A certain mail-route is 57 miles long; on 25 miles of it the mail is carried six times a week; on 17 miles, 3 times a week, and on 15 miles, twice a week. The pay is \$1,617 per annum. What would be the additional cost per annum, *pro rata*, to increase the service to six times a week, over the entire route?

Examination for promotion. Date of examination, January 7 and 8, 1873.—Examination for admission. Date of examination, January 15-18, 1873.

In your answers to the following questions give the work in full, and opposite the answer write plainly, *answer*. Common fractions must be reduced to their lowest terms, and decimals, if there is a remainder, must be carried out to four places.

A railroad-route, on which the pay was \$75 per mile per annum, was extended, at different times, $3\frac{1}{2}$ miles, $7\frac{1}{2}$ miles, and $9\frac{1}{2}$ miles. What was the whole extension and the whole cost? Give the distance in miles and common fractions of miles, and the cost in dollars and common fractions of dollars.

Add fifty-six thousand and fourteen thousandths, nineteen, and nineteen hundredths, fifty-seven and forty-eight ten thousandths, twenty-three thousand five and four-tenths, and fourteen millionths.

Divide five hundred and sixty-seven thousand eight hundred and ninety-one millionths, by eight and two-tenths.

What is the bank discount of a draft of \$1,350.50, payable in one year and four months, at 5 per cent.?

A mail-route, 62 miles in length, had 6 times a week service on 24 miles, 3 times a week on 32 miles, and twice a week on 6 miles. The annual pay was \$1,953. The service was raised to 6 times a week, over the whole route, at *pro rata* additional pay. Afterwards the route was curtailed 27 miles, at *pro rata* deduction of pay; what was the pay after that curtailment?

BOOK-KEEPING.

Examination for promotion. Date of examination, June 17, 1872.

John Quinn, a disbursing officer, receives from the Treasury on the 1st January, 1872, \$50,000. He has a salary of \$2,000 per annum, and a commission of 3 per cent. on his disbursements. On the 1st February he pays out \$20,000, for which he has proper vouchers. On the 1st March he pays out \$20,000, and on the 15th \$5,000, taking receipts. On the 31st he pays his own salary for the quarter, and retains the commission on his disbursements, except his own salary. State his account with the United States for the quarter ended 31st March, 1872.

Examination for promotion. Date of examination, July 8 and 13, 1872; January 13, 1873.

Thomas Brown is contractor on route No. 79821, at \$4,000 per annum. In April he lost a mail-pouch, for which he was fined \$25. May 1, 3, 8, 10, 15, 17, he failed to convey the mail at all, and a deduction was made of \$307.68. June 10 he was fined \$10 for employing a carrier under age. June 12, 14, 21, he failed to take the mail, and \$153.84 was deducted from his pay. June 30 an order was made to remit \$100 of the deduction made in May. In July he collected from the postmasters on the route the sum of \$350, and forwarded acknowledgments to that amount.

State his account with the United States for the quarter ended June 30.

Examination for admission. Date of examination, July 15-19, 1872.—Examination for promotion. Date of examination, July 30, 1872.

John Brown, a disbursing officer, has the sum of \$20,000 placed in his hands on the 1st January, 1872, to make certain payments on public account. His salary is \$2,000 per annum, and he is allowed a commission of 3 per cent. on the amount paid out. He pays out \$15,000, for which he has proper vouchers, and out of the balance retains his salary for the quarter and his 3 per cent. commission.

State his account with the United States for the quarter ending March 31, 1872.

Examination for admission. Date of examination, September 30 and October 1 and 2, 1872.—Examination for promotion. Date of examination, December 18, 1872; January 14, 1873.

John Pratt, a disbursing officer of the Government, has in his hands on the 1st April \$9,782. On the 15th he receives \$5,428 more from the Treasury, and on the same day he pays out \$5,275, on which he is entitled to a commission of $2\frac{1}{2}$ per cent. On the 1st May he pays the salaries of two clerks for the month of April, at the rate of \$1,000 per annum each, and on the 21st he pays out \$5,420, on which he is allowed a commission of $3\frac{1}{4}$ per cent. On the 1st June he pays his clerks their salaries, as above, for the month of May, and on the same day he receives a further sum from the Treasury of \$2,500.

State his account with the United States. Rule and head the paper on which the statement is made in a manner proper for that purpose.

Examination for promotion. Date of examination, January 7, 8, 1873.—Examination for admission. Date of examination, January 15-18, 1873.

John Jones, postmaster at Brownsville, Maine, on the 30th June, 1870, was debtor to the United States in the sum of \$875.96; on the 15th July he paid draft against him of \$750; on 20th July he received postage-stamps amounting to \$1,420, of which \$175.86 worth were returned, damaged, to the Department, and the balance sold during the quarter; on the 1st August he advanced \$55, and again on the 15th August \$20 on his clerk's salary, rated at \$900 per annum; on 1st September he paid draft against him of \$800; on 10th September he collected draft against a neighboring postmaster for \$325, and on 15th September another for \$175; on 30th September he paid balance of salary due his clerk for the quarter, (three months,) also his own quarterly salary, at the rate of \$2,100 per annum, deducting the income tax of 5 per cent., charged on the excess above \$2,000 a year. During the quarter he collected \$17.50 for unpaid postages on letters received; \$27.30 for newspaper postages; \$130 for box-rents, and \$8 for twine and waste paper sold.

State his account with the United States, in form, up to and inclusive of September 30, 1870.

HISTORY.

Examination for promotion. Date of examination, June 17, 1872.—Examination for admission. Date of examination, July 15-19, 1872.

What event in American history is known as the Boston Tea Party?

Who was President of Congress at the time of the Declaration of Independence?

What difficulty occurred between the United States and France soon after the close of the Revolution?

Did any actual hostility take place between the two countries?

What brought on the war with England in 1812?

What battle was fought after the treaty of peace had been signed?

Examination for promotion. Date of examination, July 8 and 13, 1872; January 13, 1873.

Name the original thirteen States.

What two States at first dissented from the Constitution and were the last of the thirteen to adopt it?

Examination for promotion. Date of examination, July 8 and 13, 1872.

When was the Constitution formed; when adopted, and when did it go into effect?

Examination for promotion. Date of examination, July 8 and 13, 1872; January 13, 1873.

Who was the first Vice-President?

Examination for promotion. Date of examination, July 8 and 13, 1872.

Who was the first Secretary of State?

Who was Alexander Hamilton?

What two ex-Presidents died on the same day, and what day was it?

During what administration did two great political parties first arise in the United States; what names were they known by; what produced them, and what was the difference between them?

Who was Vice-President under President Monroe, and how long did he serve?

What American general, in the war of 1812, surrendered his whole army, and was sentenced to be shot for cowardice?

What Vice-Presidents were afterwards elected President?

When were slaves first introduced into the United States, and from what date was the slave-trade abolished?

Examination for promotion. Date of examination, July 30, 1872.

What was the nature of the *Stamp Act* passed by the British Parliament in 1765?

In what city did the Colonial Congress assemble, and what action was taken in regard to the *Stamp Act*?

When and where did the first inauguration of the first President of the United States take place?

What two Presidents of the United States had the same surname, and what relationship existed between them?

Under whose administration, and at what price, was Louisiana purchased from the French?

For what reason was the sum of two millions and a half of the purchase-money in the above transaction withheld by the United States?

Why was it that Vermont was not admitted into the Union until the Revolution was over, notwithstanding she bore so conspicuous a part in that struggle?

Examination for admission. Date of examination, September 30, and October 1 and 2, 1872.

What was the first State admitted into the Union after the adoption of the Constitution?

Who was President of the United States during the war with Mexico?

Who was Speaker of the House of Representatives when John Quincy Adams was elected President of the United States?

Examination for promotion. Date of examination, December 18, 1872; January 14, 1873.

In what manner was John Quincy Adams elected President of the United States?

Examination for promotion. Date of examination, January 7 and 8, 1873.—Examination for admission. Date of examination, January 15-18, 1873.

Who commanded the British forces at the battle of New Orleans?

Who was Tecumseh?

Under whose administration was Florida ceded to the United States?

GEOGRAPHY.

Examination for promotion. Date of examination, June 17, 1872.

How many States are there in the Union?

What United States territory is separated from Asia by Behring's Strait?

What region is known as the valley of the Mississippi?

Name the States and Territories bordering on British territory, commencing at the east.

Examination for promotion. Date of examination, July 8 and 13, 1872.—Examination for admission. Date of examination, July 15-19, 1872.

Where do the Rocky Mountains enter the United States, and in what general direction do they run?

In what State do the Alleghany Mountains begin, in what general direction do they run, and in what State terminate?

Name two or three of the principal ridges of the Rocky Mountains.

Name two or three of the principal ridges of the Alleghanies, and name the States in which they are situated.

What part of the United States is the Atlantic slope? Pacific slope?

Examination for promotion. Date of examination, July 13, 1872, and January 13, 1873.
Examination for admission. Date of examination, July 15-19, 1872.

What is the source of the Mississippi?

Examination for promotion. Date of examination, July 8 and 13, 1872.—Examination for admission. Date of examination, July 15-19, 1872.

What is the chief affluent of the Mississippi; and what are its principal tributaries from the east, and what from the west?

Name the principal rivers east of the Alleghanies.

What is the smallest State in the Union?

In what zone are the United States located?

Examination for promotion. Date of examination, July 30, 1872.

What are the tropics?

What is a zone? Name all of them.

How much of the earth's surface is land?

Name the grand divisions of the land.

Examination for promotion. Date of examination, July 30, December 18, 1872, and January 14, 1873.

What are the two great water-sheds of the United States?

Examination for promotion. Date of examination, July 30, 1872.

Which one of the great lakes lies wholly within the United States?

What is the highest mountain peak in North America?

Examination for admission. Date of examination, September 30, and October 1 and 2, 1872.

Bound the State of Indiana.

Where is Mount Washington?

What is the capital of Wyoming Territory?

Where does the Connecticut River rise, in what direction does it flow, and into what body of water does it empty?

Examination for promotion. Date of examination, January 7 and 8, 1873.—Examination for admission. Date of examination, January 15-18, 1873.

Are the great lakes situated wholly within the United States?

Where is Lake Champlain?

Name the Middle States.

Where do the Rocky Mountains enter the United States?

In what State do the Alleghany Mountains begin?

GOVERNMENT.

Examination for promotion. Date of examination, June 17 and July 30, 1872.

What is the form of the Government of the United States?

How is the President chosen?

What are the three co-ordinate branches of the Government?

How are Senators chosen?

Why has Delaware as many Senators as New York?

Can a bill become a law without the approval of the President?

What is the treaty-making power?

In case of the death of the President and Vice-President, upon whom would the presidential duties and powers devolve?

What is the distinction between a State and a Territory?

Why are not the Territories represented in the Senate as well as in the House?

Examination for promotion. Date of examination, July 8 and 13, 1872.—Examination for admission. Date of examination, July 15-19, 1872.

What are the constitutional qualifications for a Senator of the United States in regard to age and citizenship?

Under the United States form of government, in whom is the sovereignty vested?

What is the supreme law of the land?

Can a Senator or Representative be impeached?

What are the constitutional qualifications for the office of President in respect to nativity, age, and residence?

In what case can the President adjourn Congress?

Examination for promotion. Date of examination, July 8 and 13, 1872, and January 13, 1873.—Examination for admission. Date of examination, July 15-19, 1872.

What limitation is there to the pardoning power of the President?

Examination for promotion. Date of examination, July 8 and 13, 1872.—Examination for admission. Date of examination, July 15-19, 1872.

Where is the judicial power of the United States vested?

Examination for promotion. Date of examination, July 8 and 13, 1872, and January 13, 1873.—Examination for admission. Date of examination, July 15-19, 1872.

Is the power of Congress absolute or limited?

Can the Senate present articles of impeachment?

Examination for promotion. Date of examination, July 8 and 13, 1872.—Examination for admission. Date of examination, January 15-19, 1873.

How may amendments to the Constitution be proposed?

Examination for promotion. Date of examination, July 8 and 13, 1872, and January 13, 1873.—Examination for admission. Date of examination, July 15-19, 1872.

What proportion of the States is necessary to ratify an amendment?

Examination for admission. Date of examination, July 15-19, 1872.

What is the first amendment?

Examination for promotion. Date of examination, July 8 and 13, 1872.—Examination for admission. Date of examination, July 15-19, 1872.

What are the reserved rights of the States?

What is the distinction between direct and indirect taxes?

Examination for admission. Date of examination, September 30 and October 1 and 2, 1872.

Where is the executive power of the United States lodged?

Is there any express power given to Congress to add new territory to the United States?

NOTE.—This question also used for examination for promotions, December 18, 1872, and January 14, 1873.

Has the President any authority to declare war?

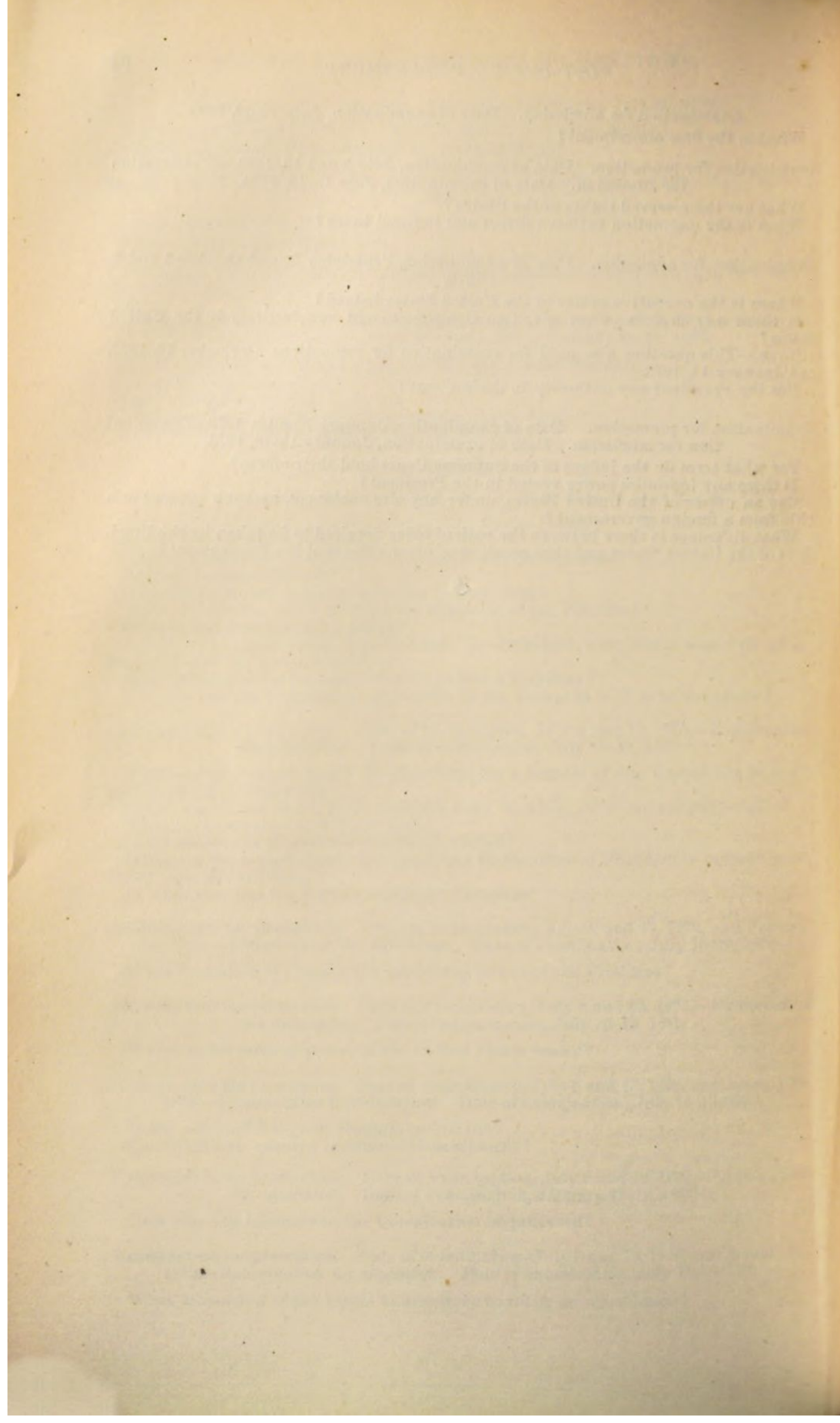
Examination for promotion. Date of examination, January 7 and 8, 1873.—Examination for admission. Date of examination, January 15-18, 1873.

For what term do the judges of the Supreme Court hold their offices?

Is there any *legislative* power vested in the President?

Can an officer of the United States, under any circumstances, accept a present or a title from a foreign government?

What difference is there between the oath of office required to be taken by the President of the United States and that required of other officers of the Government?



QUESTIONS IN CIVIL-SERVICE EXAMINATIONS—TREASURY
DEPARTMENT.

L E T T E R

FROM

THE SECRETARY OF THE TREASURY,

RELATIVE TO

The questions propounded by the examiners to the candidates for appointments and promotions to clerkships in his Department.

FEBRUARY 8, 1873.—Referred to the Committee on Civil Service and ordered to be printed.

TREASURY DEPARTMENT,
Washington, D. C., February 1, 1873.

SIR: In reply to so much of the resolution offered by Hon. B. F. Butler, January 27, 1873, as follows:

* * * * *
* * * * *
“Resolved, That the Secretary of the Treasury, * * * * *
* * * * * be, and they are hereby, directed
to furnish this House with a copy of all the questions propounded by
the examiners to the candidates for appointments and promotions to
clerkships in their respective Departments,” I have the honor to inclose
herewith a complete set of the questions used in the twenty-eight ex-
aminations for admission and promotion held by the Civil-Service Board
of the Treasury Department, from the commencement of operations un-
der the civil-service regulations to the 31st day of January.

Very respectfully, your obedient servant,

GEO. S. BOUTWELL,
Secretary.

HON. JAMES G. BLAINE,
Speaker House of Representatives.

THE SECRETARY OF THE TREASURY
WASHINGTON

DEPARTMENT OF THE TREASURY
WASHINGTON

LETTER

TO

THE SECRETARY OF THE TREASURY

WASHINGTON

The enclosed copy of the report of the Committee on the
Finance of the United States is herewith transmitted.

Very respectfully,
Your obedient servant,

THE SECRETARY OF THE TREASURY
WASHINGTON

Enclosed for the Secretary of the Treasury is a copy of the report of the Committee on the Finance of the United States, as transmitted to the Senate on January 1, 1875, and as approved by the Senate on January 1, 1875. The report contains a full and complete statement of the financial condition of the United States, and of the means for the improvement of the same. It also contains a full and complete statement of the means for the improvement of the same. The report is a valuable and important document, and it is hoped that it will be of great service to the Government.

Very respectfully,
Your obedient servant,

THE SECRETARY OF THE TREASURY
WASHINGTON

QUESTIONS USED IN TWENTY-EIGHT CIVIL-SERVICE EXAMINATIONS IN THE TREASURY DEPARTMENT FROM JUNE 5, 1872, TO JANUARY 31, 1873.

Extracts from regulations governing admission to the Department.

VIII. All candidates for appointment to clerkships of class one, who shall appear in accordance with such notification, will be subjected to a public competitive written examination upon the following subjects:

(1) Penmanship; (2) writing and briefing letters; (3) elements of English grammar, chiefly orthography and syntax; (4) arithmetic: fundamental rules, fractions, percentage, interest, and discount; (5) elements of accounts and book-keeping; (6) history and geography: general questions, principally such as relate to the United States; and (7) prominent features of the Government of the United States.

IX. The various subjects of the examination may be subdivided, if thought desirable, into classes, and to each subject or class a relative weight, according to its importance in the examination, will be assigned by each board of examiners. The mode of ascertaining the result of the examination will be as follows: The degree of accuracy with which each question shall be answered will first be marked by the board on a scale of 100. The average of the marks given to the answers to the questions in each subject or class will next be ascertained. Each average will then be multiplied by the number indicating the relative weight of the subject or class, and the sum of the products will be divided by the sum of the relative weights; the quotient will determine the candidate's standing in the examination. Relative weight will be assigned not merely to the special qualifications of the candidates, but to their general aptitude as shown in the course of the examination.

Candidates will be examined during office-hours, and in no case will their examination be continued more than one day.

Extract from regulations governing examinations for promotion.

II. The examination will be held upon the general subjects fixed for examinations for clerkships of class one, and upon such other subjects as the general nature of the business of the department or office, and the special nature of the position to be filled, may seem to the board of examiners to require. Due weight will be given to the efficiency with which the several candidates shall have previously performed their duties in the Department; but no one who shall fail to pass a minimum standard of sixty *per centum* in the written examination will in any case be certified for appointment.

The following scale of relative weights was used in all the examinations for appointments to clerkships of class one:

Subject and class.	Relative weight.
Arithmetic:	
Notation and numeration	1
Addition	1
Miscellaneous questions	6
Accounts	2
History, geography, and government	2
Grammar:	
Orthography	4
Syntax	4
Punctuation	1
Letter and brief	1
Penmanship	4
	26

The following was used in the examination for Deputy Comptroller of the Currency:

Subject and class.	Relative weight.
Arithmetic:	
Miscellaneous questions	6
Accounts	3
History, geography, and government	3

	Subject and class.	Relative weight.
Grammar:		
Orthography		4
Syntax		4
Punctuation		1
Letter and brief.....		2
Penmanship.....		2
Questions pertaining to office		15
Efficiency		10
		50

The following was used in the examination for head of division, Office of Internal Revenue:

	Subject and class.	Relative weight.
Arithmetic:		
Miscellaneous questions		6
Accounts		2
History, geography, and government		3
Grammar:		
Orthography		4
Syntax		4
Punctuation		1
Letter and brief.....		3
Penmanship		3
Efficiency.....		3
Internal revenue law.....		7
Practice under the law		7
		50

And the following in the other examinations for promotion:

	Subject and class.	Relative weight.
Arithmetic:		
Notation and numeration		1
Addition		1
Miscellaneous questions.....		6
Accounts.....		2
History, geography, and government.....		2
Grammar:		
Orthography		4
Syntax.....		4
Punctuation		1
Letter and brief.....		1
Penmanship		4
Questions pertaining to office		6
Efficiency.....		8
		40

EXAMINATION No. 1.—PROMOTION.

OFFICE OF THIRD AUDITOR, *June 5, 1872.*

1.

* Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given on the page opposite the questions to which they pertain.

1. Name ?
2. Residence ?
3. Place of birth ?
4. Date of birth ?
5. State briefly as to elementary education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?

* The restriction as to the time to be used for each paper was applied in only the first four examinations.

8. State in what division of the office you have been employed, and the character of the duties you have performed.

2.

Ten minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given on the page opposite the questions to which they pertain

9. Write in figures the following numbers:

One thousand and one.

Seventy-five thousand five hundred and fifty.

One hundred and ten and decimal one-hundredth.

10. Write at length the numbers expressed by following figures:

20,050.

4,002,010.

.112.

2,004.204.

3.

Twenty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

11. Add the following columns of figures, and give the answer immediately under the column to which it pertains:

37,640,787 95
109,741,134 10
209,464,215 25
309,226,813 42
266,027,537 43
191,087,589 41
158,356,460 86
311,533 83
194,572 32
24,709 46
118,248 30
92,718 50
150,476 14
103,880 82
149,004 15
175,111 81

37,640,787 95
109,741,134 10
209,464,215 25
309,226,813 42
266,027,537 43
191,087,589 41
158,356,460 86
311,533 83
194,572 32
24,709 46
118,348 30
92,718 50
150,476 14
103,880 82
149,004 15
175,111 81
193,636 59
269,803 41
315,022 36
205,217 87
379,558 23
384,720 19
445,485 18
464,546 52
427,124 98
337,032 62
315,783 47
457,919 66
509,113 37
738,949 15

4.

Forty-five minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given on the page opposite the questions to which they pertain.

Express the answers decimally, and show the operation in each case.

12. A quartermaster purchased 20 tons of hay, at \$10.50 per ton; 1,575 pounds of corn, at $87\frac{1}{2}$ cents per bushel, (56 pounds to the bushel;) 1,956 pounds of oats, at $37\frac{1}{2}$

8.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given on the page opposite the questions to which they pertain.

20. When and by whom was America discovered?

21. When and by what body was the Declaration of Independence adopted?

22. Who commanded the American Army during the revolutionary war?

23. Name the first four Presidents of the United States.

24. What officer is commander-in-chief of the Army and Navy of the United States?

25. How many United States Senators is each State entitled to, and how and for what length of time are they elected?

26. Does the Constitution authorize Congress to pass laws for the establishment of any religion?

27. What are the grand divisions of the earth?

28. Bound the United States.

29. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

Twenty-five minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it on the examiner's desk.

The answer must be given on the opposite page.

Copy the following and correct the orthography and punctuation:

30. The accounts of quartermasters cover a wide and varied rainge of disbursments and property acountibility embraceing disbursements for barricks quarters hospittles store houses ofices stables army clotheing camp and garison equippage calvery and artillery horses fuil forage, straw materiel for beding stationary hired men, per diem to extry duty men, the pursoot and apprehenchen of disserters the buriel of officers and soldiers hierd escorts expresses interpersters spies and guides vetterrinery sergeons and medicins for horses supplyng postes with water, and generraly the propper and authorised expences for the movments and opperations of an army not expresly assined to anny-other department. The "returns" are an account of the disposishun maid of all propperty payed for by the quartermasters-Department.

10.

Twenty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given on the page opposite the questions to which they pertain.

31. Correct the following sentences:

You was paid to fight against Alexander, not to rail at him.

The natural distinction of sex in animals give rise to what in grammar is called genders.

The mechanism of clocks and watches were totally unknown.

It was not him that did it, it was I.

She reads proper, writes very neatly, and composes accurate.

A mothers tenderness and a fathers care are natures gifts for mans advantage.

Every one must judge of their own feelings.

Neither despise or oppose what thou dost not understand.

11.

One hour and thirty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

32. Answer the following letter, and fold and brief your reply:

WASHINGTON, June 1, 1872.

Hon. ALLAN RUTHERFORD, *Third Auditor of the Treasury*:

SIR: I have the honor to request that you will furnish me with full answers to the following inquiries, for the information of one of my constituents:

1. Upon what accounts does the Third Auditor act?

2. What officers of the Army act as disbursing officers?
3. In what manner do they obtain funds for disbursement?
4. What are the duties of pension-agents?
5. What public funds are disbursed by pension-agents, and how are their disbursements made?
6. At what time and through what channels do officers of the Army render their account of funds and property received by them?
7. Please briefly state the method of examination of an officer's money-accounts.
8. Please briefly state the method of examination of an officer's property-accounts.
9. Please briefly state the method of examination of pension-agents' accounts.

Very respectfully,

JOHN SMITH, M. C.

EXAMINATION No. 2.—PROMOTION.

OFFICE OF AUDITOR OF TREASURY
FOR THE POST-OFFICE DEPARTMENT,
June 6, 1872.

1.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately after the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to elementary education?
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you have been employed, and the character of the duties you have performed.

2.

Ten minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:
Twenty thousand and one.
Seven millions and fifty.
One hundred and eleven and decimal twelve-hundredths.
10. Write at length the numbers expressed by following figures:
41,005.
23,000,001.
.021.
4,001.301.

3.

Twenty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer under the column to which it pertains:

37,640,787 95
 109,741,134 10
 209,464,215 25
 308,226,813 42
 266,027,527 43
 191,087,589 41
 158,356,460 86
 311,533 83
 194,572 32
 24,709 46
 118,248 30
 92,718 50
 150,476 14
 103,880 82
 149,004 15

37,640,787 95
 109,741,134 10
 209,464,215 25
 309,226,813 42
 266,027,537 43
 191,087,589 41
 158,356,460 86
 311,533 83
 194,572 32
 24,709 46
 118,248 30
 92,718 50
 150,476 14
 103,880 82
 149,004 15
 175,111 81
 193,636 59
 269,803 41
 315,022 63
 205,217 87
 379,558 23
 384,720 19
 445,485 18
 464,546 52
 427,124 98
 337,032 62
 315,783 47
 457,919 66
 509,113 37

4.

Forty-five minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation in each case.

12. John Smith renders an account-current as postmaster at Smithville, New York from April 1 to May 20, 1872, and Thomas Brown from May 21 to June 20, 1872. What amount of compensation should be credited to each, the annual salary of the office being \$1,800?

13. A disbursing-agent receives \$11,724.83. He pays out \$4,096.48, and the residue he disburses to five sub-agents, as follows: The first receives a fourth part, and the remainder is divided equally among the others. What was the share of each?

5.

Fifty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation in each case.

14. A quartermaster bought $5\frac{2}{3}$ cords of wood at one time, and 24 $\frac{5}{6}$ cords at another. After issuing 16 $\frac{7}{9}$ cords, how much remained?

15. What amount is due a mail-contractor for the quarter ending June 30, his contract pay being \$1,125 per annum, pay increased \$639 per annum from May 2?

16. What amount is due a mail-contractor for the quarter ending December 31, contract pay \$725 per annum, pay decreased \$369 per annum from November 1, and increased \$248 per annum from November 16?

6.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation in each case.

17. The total population of four western towns in 1860 was 40,000. The number of inhabitants in the first was 22,000, in the second 11,000, in the third 5,000, and in the fourth 2,000. In 1870 the total population of the towns had increased 25 per cent. What was the population of each town in 1870?

18. If the premium on gold is $15\frac{1}{8}$ per cent., what amount of gold must I sell to pay a note of \$165 in currency?

7.

Thirty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed within less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

19. William Brown, postmaster at Brownsville, Indiana, transacts the following business on money-order account, viz :

Issues money-orders amounting to.....	\$51,125 75
Collects fees on same	51 50
Transfers from postage account	515 00
Pays money-orders amounting to.....	25,009 15
Repays money-orders amounting to	112 18
Transfers to postage account.....	515 00
Deposits surplus funds.....	20,000 00

The postmaster is entitled to the following commissions, viz: one-third of the fees collected on orders issued, and one-fourth of one per cent. on the aggregate amount of orders paid.

Make a statement of his account in the form on the opposite page, showing balance due the United States.

[illegible]

8.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. When and where was the first battle of the Revolution fought?

21. When and where did the first continental Congress meet?

22. When and where did the surrender of General Lee take place?

23. Who was the fifth President of the United States?

24. What proportion of the States is required to ratify an amendment to the Constitution?

25. After a bill, passed by Congress, has been vetoed by the President, can it become a law? If so, in what manner?
26. Describe the duties of the Vice-President of the United States.
27. About what is the population of the United States?
28. Where is Chesapeake Bay?
29. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

Twenty-five minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it on the examiner's desk.

30. Copy the following and correct the orthography and punctuation:

Each subdivision reports weekly to the cheaf exsaminor, and monthly, through that ofiser to the cheef clerk the proggres of the work. so that the egsact ammount of work done by each clerk is cleerley asertaned.

all vouchers; relitive to allowances; made by the Post-offis-department for clerke hier lites fewil rent stationary &c at post Offises of the 1st and 2d Classes are forwardid at the begining of each quarter to the chief examinar and his asistent for exs-amination a staitment is then prepared showing the vouchers-recieved the ammount-alowed and the ammount suspended when found to be in exses of the allowance. on reciept of the returns, from the examinars these acounts are reviewed and, the amount allowable addid and, the ballance drawn by the chief examinar.

10.

Twenty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

31. Correct the following sentences:

The happy effects of this fable is worth attending to.

The arrows of calumny fall harmlessly at the feet of virtue.

Which dictionary do you prefer, Worcester or Webster's?

Some systems, so far from making men better, have a tendency to make him worse.

He instructed and fed the crowds who surrounded him.

They took possession of the heights where the enemy had laid.

Nenter verbs neither act upon or govern nouns and pronouns.

Poverty and obscurity will oppress him only who esteem it oppressive.

11.

One hour and thirty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

32. Answer the following letter, and fold and brief your reply:

TREASURY DEPARTMENT, *Washington, June 1, 1872.*

Hon. J. J. MARTIN, *Auditor of Treasury for Post-Office Department:*

SIR: I have the honor to request that you will furnish me with the following information, which I desire to use in my forthcoming report:

1. What duties are assigned by law to the Auditor of the Treasury for the Post-Office Department?

2. Are the settlements and decisions of the Auditor final? If not, to what officer does an appeal lie?

3. Into what divisions is that Bureau divided?

4. State briefly the work assigned to each division.

5. How and by whom is the Auditor's office notified of changes of postmasters made by the Postmaster-General?

6. How notified, and by whom, of contracts executed for transportation of the mails and furnishing supplies for the Post-Office Department, and orders for the Postmaster-General extending, curtailing, or annulling the same?

7. Explain the difference between an Auditor's draft and a Postmaster-General's draft.

Very respectfully,

GEO. S. BOUTWELL,
Secretary.

EXAMINATION No. 3.—PROMOTION.

OFFICE OF COMMISSIONER OF CUSTOMS,
June 6, 1872.

1.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately after the questions to which they pertain.

1. Name.
2. Residence.
3. Place of birth.
4. Date of birth.
5. State, briefly, as to elementary education.
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you have been employed, and the character of the duties you have performed.

2.

Ten minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write, in figures, the following numbers:

Three thousand and forty-two.

Twelve millions and twenty-one.

One hundred and two, and decimal eleven-hundredths

10. Write at length the numbers expressed by the following figures:

200, 050

25, 200, 001

2, 301

23, 021. 43

3

Twenty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer under the column to which it pertains:

37,640,787.95	37,640,787.05
109,741,134.10	109,731,134.10
209,464,215.25	209,464,215.25
309,226,813.42	309,226,813.42
266,027,537.43	266,027,537.43
191,087,589.41	191,087,589.41
158,356,460.86	158,356,460.86
311,533.83	311,533.83
194,572.32	194,572.32
24,709.46	24,709.46
118,248.30	118,248.30
92,718.50	92,718.50
150,476.14	150,476.14
103,880.82	103,880.82
	149,004.15
	175,111.81
	193,636.59
	269,803.41
	315,022.36
	205,217.87
	379,559.23
	384,720.19
	445,485.18
	464,546.52
	427,124.98
	337,032.62
	315,783.47
	557,919.66

4.

Forty-five minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation in each case.

12. The Treasury Department bought on contract 500 reams of foolscap-paper, at \$3.87½ per ream, 50½ reams of which were returned as unsuitable. Also 325 reams of letter-paper, at \$2.62½ per ream, 25½ reams of which were rejected. How much was paid for the remainder?

13. A disbursing agent receives \$10,724.83. He pays out \$4,000.48, and the residue he disburses to five sub-agents, as follows: The first receives a fourth part, and the remainder is divided equally among the others. What was the share of each?

5.

Fifty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation in each case.

14. The duty on proof brandy is \$2 per gallon, and in proportion for greater strength. What is the duty on brandy of 70° strength, on a scale of 50°?

15. What is the duty, at 6½ cents per yard and 12 per cent. *ad valorem*, on 350 yards of cotton goods costing 20 cents per yard, with the usual addition of 2½ per cent. for commissions?

16. James Brown was appointed an officer of the Treasury at a salary of \$3,000 per annum on the 3d of June, 1871. He retired August 15, 1871. To how much pay was he entitled, both days being included?

6.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation in each case.

17. An officer of the United States deposits in the Treasury \$35,000, having retained 3 per cent. on the whole amount collected. What amount did he collect?

18. If the premium on gold is $15\frac{3}{4}$ per cent., what amount of gold must one sell to pay a note of \$150 in currency?

7.

Thirty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

19. John Smith is a disbursing agent of the United States. January 1, 1872, there is in his hands \$16,875.68. February 1 he pays out \$3,392.75, on which he is entitled to a commission of $1\frac{3}{4}$ per cent. March 1, he receives \$3,750.87. May 1, he pays out \$2,997.50, on which he is entitled to a commission of $2\frac{1}{2}$ per cent.

Make a statement of his account in the frame on the opposite page, showing balance due the United States.

[illegible]

8.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when this paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. Who commanded the American, and who the British force, at Yorktown in 1781?

21. Who commanded the American, and who the British army, at New Orleans, January 8, 1815?

22. When, and where, did General Lee surrender?

23. Name the first six Presidents of the United States.

24. Who administers the oath to the President on entering upon the duties of his office?

25. What form of government is that of the United States? England? Russia?

26. To what branch of the Government does the Constitution give the right to declare war against a foreign nation?

27. What are the geographical divisions of America ?

28. Where is Delaware Bay?

29. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

Twenty-five minutes will be allowed for the completion of this paper; at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

30. Copy the following, and correct the orthography and punctuation:

These accounts comprize staitments and vouchers not only of all goods enterd at anny porte and actualy placed in bondid wairhouses but allso of all goods enterd at such porte for amediate exporttation to forrin countreys such goods bein considerd as constructivly warehoused, in these accounts are abstracs of all goods withdrawn, from

warehouse for consumption transportashun to otther portes or exportation, to forrin countrys, They containe allso statements of salt; withdrawn from warehouse purseuent to the provishuns of the fourth section act July 28, 1866 to be taken on board vesels lisensed for the fisherys under bond to be used in curing fish, seperate acounts are rendered of all transportation exportation and salt-bonds taken to cover such withdrawel.

10.

Twenty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

31. Correct the following sentences :

In him were happily blended true dignity with softness of manners.

The soldiers marched slow.

He bought his watch at Ball's and Black's, New York.

Everybody trembled for themselves or their friends.

Various places was found in the sand where the ostriches had lain their eggs.

Some men are like so many puppets who are moved by wires.

John the Baptist came neither eating bread or drinking wine.

What is the student who I gave the book to, and whom, I am persuaded, deserves it ?

11.

One hour and thirty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

32. Answer the following letter and fold and brief your reply :

WASHINGTON, June 1, 1872.

Hon. W. T. HAINES,

Commissioner of Customs.

SIR: I have the honor to request that you will furnish me with full answers to the following inquiries, for the information of one of my constituents :

1. How are commissioned officers of the customs appointed ?
2. How are subordinate officers of the customs appointed ?
3. What is the fundamental customs act of Congress ?
4. Explain the meaning of the words *ad valorem* and specific as used in the tariff.
5. What is the Treasury rule for the calculation of salaries, fixed by the year, for shorter periods than one year ?
6. How are funds for disbursement obtained from the Treasury by customs disbursing agents ?
7. What kind of money is receivable for duties ?
8. From what are the emoluments of customs officers derived ?
9. What is necessary, in all cases, before a custom appointee can enter on the duties of his office and receive pay ?

Very respectfully,

JOHN SMITH, M. C.

EXAMINATION No. 4.—ADMISSION.

TREASURY DEPARTMENT, June 10, 1872.

1.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately after the questions to which they pertain.

1. Name ?
2. Residence ?
3. Place of birth ?
4. Date of birth ?
5. State briefly as to elementary education.
6. What subsequent experience in business or profession ?

2.

7. What clerical experience?

Ten minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck when the paper will be taken up by the examiner.

If completed in less than the prescribed time the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

8. Write in figures the following numbers:

Two thousand and three.

Seven hundred and fifty thousand two hundred and four.

Two hundred and five, and decimal three-thousandths.

9. Write at length the numbers expressed by the following figures:

210,073.

50,210,103.

2,103.

40,001.3201.

3.

Twenty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

10. Add the following columns of figures and give each answer under the column to which it pertains:

37,640,787.95	37,640,787.95
109,741,134.10	109,741,134.10
209,464,215.25	209,464,245.25
309,222,813.42	309,256,813.42
266,028,537.44	266,027,537.43
191,087,589.41	191,087,589.41
158,356,460.86	158,356,460.86
311,533.83	311,533.83
311,533.83	194,572.32
24,909.46	24,709.46
119,248.30	118,248.30
92,718.50	92,718.50
150,476.14	150,476.14
103,880.82	103,880.82
149,004.15	140,004.15
175,111.81	175,111.81
	193,636.59
	269,803.41
	315,022.36
	205,217.87
	379,558.23
	384,720.19
	445,845.19
	464,546.52
	417,124.98
	337,032.62
	315,783.47
	457,919.66
	509,113.37

4.

One hour will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

Express the answers decimally, and show the operation at length in each case.

11. A quartermaster purchased 17 tons of hay, at \$10.50 per ton; 2,570 pounds of corn, at $87\frac{1}{2}$ cents per bushel, (56 pounds to the bushel;) 1,956 pounds of oats, at $37\frac{1}{2}$ cents per bushel, (32 pounds to the bushel;) and 10,247 feet of lumber, at \$15.62 $\frac{1}{2}$ per thousand feet. What was the total cost of the purchase?

12. A disbursing agent receives \$11,948.23. He pays out \$3,096.48, and the residue he disburses to five sub-agents as follows: The first receives a fourth part, and the remainder is divided equally among the others. What was the share of each? (Give the answers to the third decimal place.)

5.

16. A commissary of subsistence about to change quarters, and being compelled to dispose of $113\frac{3}{4}$ bushels of wheat, sold $\frac{5}{8}$ of the same at $\$2\frac{1}{4}$ a bushel, and the remainder at $\$1\frac{3}{4}$ a bushel. How much did he receive for his wheat?

6.

19. What is the interest on \$156,000 for $8\frac{1}{2}$ months at 6 per cent. a year?

7.

Make a statement of his account in the frame on the opposite page, showing balance due the United States.

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8.

Fifteen minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

21. What French nobleman was actively engaged in our Revolutionary war?
22. Who were General Arnold and Major André?
23. What was the cause of the war of 1812?
24. In what year did the war between United States and Mexico begin?
25. What does the writ of habeas corpus authorize an officer to do?
26. What are letters of marque and reprisal?
27. Does the Constitution prohibit Congress passing laws for the establishment of any religion?
28. What States border on the Gulf of Mexico?
29. What are the two principal mountain-ranges of the United States?
30. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

Twenty-five minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it on the examiner's desk.

The answer must be given immediately under the question.

Copy the following and correct the orthography and punctuation:

31. The influanse of the norman Conquest upon the language of englend like that of a grate Inundacion wich at first bury's the face of the landscap under its wators butt, wich at last subcideing leves behind it the elemants, of new buty and fertillity. it's first effeck was to degraide the saxan tong. to the exklucive use of the inferier ordors and by, the transferranse of estaits ecklesiastical benifices and civill dygnities to nor-man posesors to giv the french Language wich had begun too prevale at kourt from the time of edward The confessor a more compleat predomenense amonge the hier clasess of socity. the nativ gentre of england wer ether driven intoo exile or, depresd; intoo a stait of dependance on there conquerer wich habichuatid them to speke his languæg.

10.

Twenty minutes will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

32. Correct the following sentences:

He found the memoranda and took it home.

Do not they say, every true believer has the spirit of God in them?

The difference between he and I is not very great.

Had I known the character of the lecture I would not have went.

Neither riches nor fame render a man happy.

He admired Homer's works for its beauty.

He cannot get no employment in town.

Each man and each woman were particularly alluded to in the report of the affair.

One hour will be allowed for the completion of this paper, at the end of which time a bell will be struck, when the paper will be taken up by the examiner.

If completed in less than the prescribed time the candidate should note on the paper the exact time he has been engaged upon it, and place it upon the examiner's desk.

33. Write an account of your life, in the form and style of a letter, of not less than one page and a half in length, and fold and brief it.

EXAMINATION No. 5.—ADMISSION.

TREASURY DEPARTMENT, *July 2, 1872.*

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?

2. Residence?

3. Place of birth ?
4. Date of birth ?
5. State briefly as to your education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?

2.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

8. Write in figures the following numbers :

Three thousand and six.

Seventy-five thousand two hundred and four.

One hundred and three, and decimal two-thousandths.

9. Write at length the numbers expressed by following figures :

40,501.

23,201,302.

32.101.

33,001.203.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

10. Add the following columns of figures, and give the answer immediately under the column to which it pertains :

37,640,787	95
109,751,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,680	82
149,004	15

37,640,787	95
109,741,134	10
209,464,215	25
309,226,713	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	73
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,880	82
149,004	15
175,111	81
193,636	59
269,803	41
315,022	36
205,217	87
379,558	23
384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47
457,919	66
509,113	37

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

Show the operation at length in each case.

11. The Government, in purchasing land for a park, bought 56 acres of woodland, at \$46.34½ per acre ; 176 acres of meadow-land at \$59.46½ per acre ; and 37 acres of low-land, at \$13.83¾ per acre. What was the area of the land ; what its cost ; and what the average price per acre ?

12. A quartermaster has \$8,345 on hand, and receives \$4,379.83½ from each of six sales of property ; he turns over to one quartermaster \$3,976.48, and pays \$120 for corn.

8.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

19. Where was the first permanent settlement made in the United States?
20. In what year was the battle of Bunker Hill fought?
21. Who commanded the American Army during the Mexican war?
22. For what causes may the President of the United States be removed from office?
23. What persons are eligible to the office of President?
24. State some of the powers conferred on the President by the Constitution.
25. What limitation is there to the power of the President to grant pardons?
26. Which is the largest State in the Union, and which the smallest?
27. Name the New England States.
28. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it and place it on the examiner's desk.

The answer must be given immediately under the question.

29. Copy the following and correct the orthography and punctuation:

The cairful studdy off languidge can not fale to maik the studant acquaintid with the lauz of the humen mind. the o-rigen and formashun of wurds and the struckcher of sentenses egzibbited in ettamollogee and cintacks; taken as a hole, air butt a counterpart off thoas mentle fenominay wich hav bin colleckted and clasyfide by the masters of mentle siense, The loz of suggestion of memmerry of immajenashun of abstrackshun of gennerlisation and rezoning air distinctley exzibbitid not meerly in the hire spessimens of elokwentz and poetry but allso in the common forms off languidge; so that their is trooth in the remarc "that we mite turn a treetis on the filosofy of mind intoo won on the filosofy of languidge by nearly supposing that evvery sed in the former of the thoughts as subjecktiv is sed agen in the latter of the words as subjecktiv."

10.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

30. Correct the following sentences:

How does this mans definitions stand affected?

Each day and each hour bring their portion of study.

Neither Virgil or Homer are deficient in grandeur of style.

Neither history nor tradition furnish such information.

They live conformable to the rules of prudence.

Whose works is these? They are Cicero the most eloquent of men's.

There is no data by which it can be estimated.

What sounds have each of the vowels?

11.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

31. Write an account of your life, in the form and style of a letter, of not less than one page and a half in length, and fold and brief it.

EXAMINATION No. 6.—PROMOTIONS.

OFFICE AUDITOR OF TREASURY FOR THE
POST-OFFICE DEPARTMENT,
July 3, 1872.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?

2. Residence?

3. Place of birth?
4. Date of birth?
5. State briefly as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Three thousand and six.

Seventy-five million, two hundred and four thousand, six hundred and three.

One hundred and three, and decimal two-thousandths.

10. Write at length the numbers expressed by following figures:

40,501.

23,201,302.

32.101.

33,001.203.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give the answer immediately under the column to which it pertains:

37,640,787	95
109,741,144	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,256,460	86
311,533	83
194,272	32
24,709	46
118,248	30
92,718	50
150,476	14
103,880	82
149,004	15

37,640,787	95
109,741,134	10
209,464,215	25
309,226,813	42
277,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	38
92,718	50
150,476	14
103,880	82
149,004	15
175,111	81
193,636	59
269,803	41
315,022	36
205,217	87
379,558	23
384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47
457,919	66
509,113	37

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

13. A quartermaster has \$8,345 on hand, and receives \$4,379.83 $\frac{1}{2}$ from each of six sales of property; he turns over to one quartermaster \$3,976.48, and pays \$2,108.68 for corn. Upon being relieved from duty, he turns over to one quartermaster one-third of the residue, and divides the remainder equally among three others. What was the share of each?

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

14. The cost price of beef is $11\frac{3}{8}$ cents per pound, and flour $3\frac{1}{2}$ cents per pound. One pound and four ounces of beef and one pound and six ounces of flour are allowed to a ration. How much will 1,876 rations cost at the above rates?

16. What amount of salary is due a postmaster, whose annual compensation is \$1,100, from July 3 to August 5, 1871?

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

17. Five persons, having claims against the Government, placed their claims in the hands of an agent for collection. A's claim amounted to \$500, B's to \$425, C's to \$300, D's to \$250, and E's to \$175; but, after the agent had deducted his fees, there was but \$1,155 left. How much did each claimant receive?

7.

The above are the money-order transactions of John Jones, postmaster at Jonesville, Indiana, for the quarter ended June 30, 1871, for which he is allowed a commission of one-third of the fees collected, and one-fourth of one per cent. of the amount of *orders paid*. Make statement showing balance due the United States in the frame beneath.

[illegible]

8.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. Where was the first permanent settlement made in the United States?
21. In what year was the battle of Bunker Hill fought?
22. Who commanded the American Army during the Mexican war?
23. For what causes may the President of the United States be removed from office?
24. What persons are eligible to the office of President?
25. State some of the powers conferred on the President by the Constitution.
26. What limitation is there to the power of the President to grant pardons?
27. Which is the largest State in the Union, and which the smallest?
28. Name the New England States.
29. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

30. Copy the following and correct the orthography and punctuation:

The cairful studdy off languidge can not fale to maik the studant acquaintid with the lauz of the humen mind. the orrigin and formashun of wurds and the struckcher of sentences egzibbited in ettamollogee and cintacks; taken as a hole, air butt a counterpart of off thoas mentle fenominay wich hav bin colleckted and clasyfide by the masters of mentle siense. The los of suggestion of memmerry of immajenashun of abstrackshun of gennerlisation and rezoning air distinctly exzibbitid not meerly in the hire spessimens of elokwentz and poetry butt allso in the common forms off languidge; so that their is trooth in the remarc "that we mite turn a treetis on the filosofy of mind intoo won on the filosofy of languidge by mearly supposing that evvery sed in the former of the thoughts as subjectiv is sed agen in the latter of the words as objectiv."

10.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

31. Correct the following sentences:

How does this mans definitions stand affected?

Each day and each hour bring their portion of study.

Neither Virgil or Homer are deficient in grandeur of style.

Neither history nor tradition furnish such information.

They live conformable to the rules of prudence.

Whose works is these? They are Cicero the most eloquent of men's.

There is no data by which it can be estimated.

What sounds have each of the vowels?

11.

32. Answer the following letter, and fold and brief your reply:

TREASURY DEPARTMENT, *Washington, June 1, 1872.*

Hon. J. J. MARTIN, *Auditor of Treasury for Post-Office Department:*

SIR: I have the honor to request that you will furnish me with the following information, which I desire to use in my forthcoming report:

1. What duties are assigned by law to the Auditor of the Treasury for the Post-Office Department?
2. Are the settlements and decisions of the Auditor final; if not, to what officer does an appeal lie?
3. Into what Divisions is that Bureau divided?
4. State briefly the work assigned to each Division.
5. How are contractors credited on the ledger account with their quarterly transportation?
6. How are errors and omissions in the settlement of a quarterly account-current corrected after signature?
7. Explain the difference between an Auditor's draft and a Postmaster-General's draft.

Very respectfully,

GEO. S. BOUTWELL,
Secretary.

EXAMINATION No. 7.—PROMOTION.

BUREAU OF STATISTICS,
July 6, 1872.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to your education?
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you are now employed, and the nature of the duties you perform.

2.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Twenty thousand and six.

One hundred and twenty-three thousand two hundred and one.

Ten thousand, and decimal two-hundredths.

10. Write at length the numbers expressed by following figures:

400,205.

13,405,200.

133.4001.

44,206.301.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give the answer immediately under the column to which it pertains:

37,640,787	95
109,741,134	10
209,464,215	25
308,226,813	42
266,027,527	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,880	82
149,004	15

37,640,787	95
109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,880	82
149,004	15
175,111	81
193,636	59
269,803	41
315,022	63
205,217	87
379,558	23
384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47
457,919	66
509,113	37

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The cost price of beef is $11\frac{1}{2}$ cents per pound, and of flour $3\frac{3}{4}$ cents per pound. One pound and four ounces of beef and one pound and six ounces of flour are allowed to a ration. How much will 413 rations cost at the above rates?

13. If the premium on gold is $14\frac{7}{8}$ per cent., what amount of gold must I sell to pay a note of \$763 currency?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. A clerk in the Treasury Department was appointed January 1, 1870, at a salary of \$1,200 a year; was promoted June 15 to \$1,400; and September 20 to \$1,600. How much salary was he paid for the year ending December 31, 1870?

15. What is the amount of duty chargeable on 2,372 $\frac{1}{4}$ pounds of wool, valued at \$581.64, when the rate of duty is 10 cents per pound and 11 per cent. *ad valorem*?

16. In a county embracing a population of 97,213 persons, a tax is levied for town, county, and State purposes, amounting to \$100,406. Of this sum, a part is to be raised by a tax of 20 cents on each poll, (or person,) and the remainder by a tax of two mills on the dollar. What was the amount of property on the tax-list?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. Five persons, having claims against the Government, placed their claims in the hands of an agent for collection. A's claim amounted to \$321, B's to \$302, C's to \$284, D's to \$203, and E's to \$171; but after the agent had deducted his fees, there was but \$1,025 left. How much did each claimant receive?

18. From a kilogram (1,000 grams) of pure gold may be coined 279 of the newly-established standard 10-mark pieces of Germany. The standard gold dollar of the United States contains, of pure gold, $23\frac{23}{100}$ troy grains. A gram is equivalent to 15.432349 troy grains. What is the intrinsic value of the German mark (the new unit of account for the German empire) expressed in terms of the United States gold dollar and its decimal subdivisions?

7.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. John Smith is a disbursing agent of the United States. January 1, 1872, there is in his hands \$10,271.63. February 1, he pays out \$3,220.34, on which he is entitled to a commission of $1\frac{1}{2}$ per cent. March 1, he receives \$2,604.72. May 1, he pays out \$3,423.02, on which he is entitled to a commission of $2\frac{1}{2}$ per cent.

Make a statement of his account in the frame beneath, showing balance due the United States.

--	--	--	--	--	--	--	--

8.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. Who was President of the United States during the Mexican war?

21. What nation assisted the Americans during the Revolutionary war?

22. What were the causes leading to the Mexican war?

23. What were the causes of the late rebellion?

24. How many justices of the Supreme Court are there, and who is the Chief Justice?

25. What body tries the President in case of impeachment?

26. Whom does the Constitution authorize to declare war?

27. What chain of lakes forms part of the northern boundary of the United States?

28. What States border on the Pacific Ocean?

29. What States border on Lake Erie?

9.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

30. Copy the following and correct the orthography and punctuation:

Amunition and artilery were yet wanting. though great exertions had bin maid to obtane military stores butt. this want was, partially suplied; by an enterprize of the grean mountin boy's as the inhabitants of the country whitc is now. The state of vermont: were then caled it was knoun that the fortresess of tyconderoga and, krown point had but slender garisons and were imperfectly. gaurded Ethan allen and seth warner who comanded, sum armed voluntear's in that region undertook, upon their own responcibility to take these fourts by supprize; and they suceded 200 peices of artilery and a conciderable suply of powder were thus obtained; for the camp near Boston the british army at that plaic had bin reinforced: and now amounted to 10.000 men, under generals Howe clinton and burgoyne.

10.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

31. Correct the following sentences:

He is the strongest of the two but not the wisest.

A mans manner's frequently influence his fortune.

And let none of you imagine evil in your hearts against his neighbor.

Everybody trembled for themselves or their friends.

What signifies good opinions unless they are attended by good conduct?

They live conformable to the rules of prudence.

He cannot be above six foot, two inches high.

Neither poverty or riches are injurious to him.

11.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

32. Write a letter to the Secretary of the Treasury, of not less than a page and a half in length, explaining in general terms the duties of the Bureau of Statistics, and specifying, in detail, the duties of the division in which you are employed.

EXAMINATION No. 8.—PROMOTION.

OFFICE SUPERVISING ARCHITECT, *July 6, 1872.*

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you are now employed, and the nature of the duties you perform.

2.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Twenty thousand and six.

One hundred and twenty-three thousand two hundred and one.

Ten thousand, and decimal two-hundredths.

10. Write at length the numbers expressed by following figures:

400,205.

13,405,200.

133.4001

44,205.301.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give the answer immediately under the column to which it pertains:

37,640,787	95	37,640,787	95
109,741,134	10	109,741,134	10
209,464,215	25	209,464,215	25
309,226,813	42	309,226,813	42
266,027,537	43	266,027,537	43
191,087,589	41	191,087,589	41
158,356,460	86	158,356,460	86
311,533	83	311,533	83
194,572	32	194,572	32
24,709	46	24,709	46
118,248	30	118,248	30
92,718	50	92,718	50
150,476	14	150,476	14
103,880	82	103,880	82
149,004	15	149,004	15
		193,636	59
		269,803	41
		315,022	36
		205,217	87
		379,558	23
		384,720	19
		445,485	18
		464,546	52
		427,124	98
		337,032	62
		315,783	47
		457,919	66
		509,113	37

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The cost price of beef is $11\frac{1}{2}$ cents per pound, and of flour $3\frac{3}{4}$ cents per pound. One pound and four ounces of beef and one pound and six ounces of flour are allowed to a ration. How much will 413 rations cost at the above rates?

13. If the premium on gold is $14\frac{7}{8}$ per cent., what amount of gold must I sell to pay a note of \$763 currency.

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. A clerk in the Treasury Department was appointed January 1, 1870, at a salary of \$1,200 a year; was promoted June 15, to \$1,400; and September 20, to \$1,600. How much salary was he paid for the year ending December 31, 1870?

15. What is the amount of duty chargeable on 2,372 $\frac{1}{4}$ pounds of wool, valued at \$581.64, when the rate of duty is 10 cents per pound and 11 per cent. *ad valorem*?

16. In a county embracing a population of 97,213 persons, a tax is levied for town, county, and State purposes, amounting to \$100,406. Of this sum, a part is to be raised by a tax of 20 cents on each poll, (or person,) and the remainder by a tax of two mills on the dollar. What was the amount of property on the tax-list?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. Five persons, having claims against the Government, placed their claims in the hands of an agent for collection. A's claim amounted to \$321, B's to \$302, C's to \$284, D's to \$203, and E's to \$171; but, after the agent had deducted his fees, there was but \$1,025 left. How much did each claimant receive?

18. From a kilogram (1,000 grams) of pure gold may be coined 279 of the newly-established standard 10-mark pieces of Germany. The standard gold dollar of the United States contains, of pure gold, $23\frac{2}{100}$ troy grains. A gram is equivalent to 15.432349 troy grains. What is the intrinsic value of the German mark (the new unit of account for the German empire) expressed in terms of the United States gold dollar and its decimal subdivisions?

7.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. John Smith is a disbursing agent of the United States. January 1, 1872, there is in his hands \$10,271.63. February 1, he pays out \$3,220.34, on which he is entitled to a commission of $1\frac{1}{4}$ per cent. March 1, he receives \$2,604.72. May 1, he pays out \$3,423.02, on which he is entitled to a commission of $2\frac{1}{4}$ per cent.

Make a statement of his account in the frame beneath, showing balance due United States.

[illegible]

8.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. Who was President of the United States during the Mexican war?
21. What nation assisted the Americans during the Revolutionary war?
22. What were the causes leading to the Mexican war?
23. What were the causes of the late rebellion?
24. How many Justices of the Supreme Court are there, and who is the Chief Justice?
25. What body tries the President in case of impeachment?
26. Whom does the Constitution authorize to declare war?
27. What chain of lakes forms part of the northern boundary of the United States?
28. What States border on the Pacific Ocean?
29. What States border on Lake Erie?

10.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain

31. Correct the following sentences:

He is the strongest of the two but not the wisest.

A man's manner's frequently influence his fortune.

And let none of you imagine evil in your hearts against his neighbor.

Everybody trembled for themselves or their friends.

What signifies good opinions unless they are attended by good character?

They live conformable to the rules of prudence.

He cannot be above six foot, two inches high.

Neither poverty or riches are injurious to him.

11.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

32. Answer the following letter, and fold and brief your reply.

WASHINGTON, D. C., July 6, 1872.

A. B. MULLETT, Esq.,

Supervising Architect, Treasury Department:

SIR: Will you be kind enough to answer the following questions pertaining to your office:

1. What is the proper course for disbursing agents for the construction or repairs of public buildings to pursue to obtain funds for the prosecution of the work.
2. How often are disbursing agents required to render their accounts of disbursements?
3. How long a time, under the "Regulations," is given disbursing agents in which to render their accounts of disbursements?
4. What constitute the monthly cash papers of a disbursing agent for the construction or repairs of a public building?
5. What should the account-current exhibit?
6. What should the abstract of disbursements exhibit?
7. What should a voucher for the purchase of material required for the construction or repair of a public building exhibit?
8. How should expenditures for personal services be exhibited?
9. Through what course does an account of a disbursing agent for the construction or repairs of a public building pass, from its rendition to its final settlement?

Respectfully, yours,

THOMAS JONES.

EXAMINATION No. 9.—PROMOTION.

LIGHT-HOUSE BOARD, July 6, 1872.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State, briefly, as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you are now employed, and the nature of the duties you perform.

2.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write, in figures, the following numbers:

Twenty thousand and six.

One hundred and twenty-three thousand two hundred and one.

Ten thousand, and decimal two-hundredths.

10. Write at length the numbers expressed by the following figures:

400, 205

13, 405, 200

133. 4001

44, 206. 301

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give the answer immediately under the column to which it pertains:

37, 640, 787 95
 109, 741, 134 10
 209, 464, 215 25
 309, 226, 813 42
 266, 027, 537 43
 191, 087, 589 41
 158, 356, 460 86
 311, 533 83
 194, 572 32
 24, 709 46
 118, 248 30
 92, 718 50
 150, 476 14
 103, 880 82
 149, 004 15

37, 640, 787 05
 109, 731, 134 10
 209, 464, 215 25
 309, 226, 813 42
 266, 027, 537 43
 191, 087, 589 41
 158, 356, 460 86
 311, 533 83
 194, 572 32
 24, 709 46
 118, 248 30
 92, 718 50
 150, 476 14
 103, 880 82
 149, 004 15
 175, 111 81
 193, 636 59
 269, 803 41
 315, 022 36
 205, 217 87
 379, 559 23
 384, 720 19
 445, 485 18
 464, 546 52
 427, 124 98
 337, 032 62
 315, 783 47
 457, 919 66
 509, 113 37

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The cost price of beef is $11\frac{1}{2}$ cents per pound, and of flour $3\frac{2}{3}$ cents per pound.

One pound and four ounces of beef and one pound and six ounces of flour are allowed to a ration. How much will 413 rations cost at the above rates?

13. If the premium on gold is $14\frac{7}{8}$ per cent., what amount of gold must I sell to pay a note of \$763 in currency?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. A clerk in the Treasury Department was appointed January 1, 1870, at a salary of \$1,200 a year; was promoted June 15 to \$1,400; and September 20 to \$1,600. How much salary was he paid for the year ending December 31, 1870?

15. What is the amount of duty chargeable on 2,372½ pounds of wool, valued at \$581.64, when the rate of duty is 10 cents per pound and 11 per cent. *ad valorem*?

16. In a county embracing a population of 97,213 persons, a tax is levied for town, county, and State purposes, amounting to \$100,406. Of this sum a part is to be raised by a tax of 20 cents on each poll, (or person,) and the remainder by a tax of two mills on the dollar. What was the amount of property on the tax-list?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. Five persons, having claims against the Government, placed their claims in the hands of an agent for collection. A's claim amounted to \$321, B's to \$302, C's to \$284, D's to \$203, and E's to \$171; but, after the agent had deducted his fees, there was but \$1,025 left. How much did each claimant receive?

18. From a kilogram (1,000 grams) of pure gold may be coined 279 of the newly-established standard 10-mark pieces of Germany. The standard gold dollar of the United States contains, of pure gold, $23\frac{23}{100}$ troy grains. A gram is equivalent to 15.432349 troy grains. What is the intrinsic value of the German mark (the new unit of account for the German empire) expressed in terms of the United States gold dollar and its decimal subdivisions?

7.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. John Smith is a disbursing agent of the United States. January 1, 1872, there is in his hands \$10,271.63. February 1 he pays out \$3,220.34, on which he is entitled to a commission of $1\frac{1}{2}$ per cent. March 1, he receives \$2,604.72. May 1, he pays out \$3,423.02, on which he is entitled to a commission of $2\frac{1}{2}$ per cent.

Make a statement of his account in the frame beneath, showing balance due the United States.

[illegible]

8.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. Who was President of the United States during the Mexican war?
21. What nation assisted the Americans during the Revolutionary war?
22. What were the causes leading to the Mexican war?
23. What were the causes of the late rebellion?
24. How many justices of the Supreme Court are there, and who is the Chief Justice?
25. What body tries the President in case of impeachment?
26. Whom does the Constitution authorize to declare war?
27. What chain of lakes forms part of the northern boundary of the United States?
28. What States border on the Pacific Ocean?
29. What States border on Lake Erie?

9.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answer must be given immediately under the question.

30. Copy the following, and correct the orthography and punctuation:

Amunition and artilery were yet wanting. though grate exertions had bin maid to obtane millitary stores butt. this want was, partialy suplied; by an enterprize of the grean mountin boy's as the inhabitants of the country witch is now. The state of vermount: were then caled it was knoun that the fortresses of tyconderoga and krown point had but slender garisons and were imperfectly. guarded Ethan allen and seth warner who comanded, sum armed voluntear's in that region undertook, upon their own responcibility to take these fourts by supprize: and they suceeded 200 peices of artilery and a considerable suply of powder were thus obtained; for the camp neer Boston the british army at that plaic had bin reinforced: and now amounted to 10.000 men, under generals Howe clinton and burgoyne.

10.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

31. Correct the following sentences:

He is the strongest of the two but not the wisest.

A mans manner's frequently influence his fortune.

And let none of you imagine evil in your hearts against his neighbor.

Everybody trembled for themselves or their friends.

What signifies good opinions unless they are attended by good conduct?

They live conformable to the rules of prudence.

He cannot be above six foot, two inches high.

Neither poverty or riches are injurious to him.

11.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

32. Answer the following inquiries, in the form and style of a letter to the Board of Examiners, and fold and brief your reply:

1. What are some of the characteristics by which mariners can distinguish our lights from each other?

2. When a voucher for payment of purchase-money for a light-house site is presented, what course is to be taken before passing it?

3. An inspector, on being relieved, turned over the balances of appropriations in his hands to his successor. Is his course proper?

4. If not, what should he have done?

5. How can the mistake be rectified, the outgoing inspector being out of reach when it is discovered?

6. Describe the process of warrant and counterwarrant.

7. When the voucher of a contractor appears in an account, what course is to be taken before passing it?

8. What course should be taken to ascertain that the amounts charged on pay-rolls for monthly salaries have been duly authorized?

9. What course should be taken before passing a voucher for the pay of a light-house keeper?

Yours, respectfully,

GEORGE ROBINSON, M. C.

EXAMINATION No. 10.—PROMOTION.

SECOND AUDITOR'S OFFICE, *July 8, 1872.*

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Twenty-three thousand and six.

Two hundred and three thousand one hundred and two.

Twenty millions and one, and decimal twenty-one thousandths.

10. Write at length the numbers expressed by following figures:

253,201.

1,204,301,221.

250,000.21.

26,204.3051.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures and give the answer immediately under the column to which it pertains:

37,640,787.95	37,640,787.95
109,741,134.10	109,741,134.10
209,464,215.25	209,464,215.25
309,222,813.42	309,256,813.42
266,028,537.44	266,027,537.43
191,087,589.41	191,087,589.41
158,356,460.86	158,356,460.86
311,533.83	311,533.83
194,572.32	194,572.32
24,709.46	24,709.46
118,248.30	118,248.30
92,718.50	92,718.50
150,476.14	150,476.14
103,880.82	103,880.82
	149,004.15
	175,111.81
	193,636.59
	269,803.41
	315,022.36
	205,217.87
	379,558.23
	384,720.19
	445,485.18
	464,546.52
	427,124.98
	337,032.62
	315,783.47
	457,919.66

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The Government, in purchasing land for a park, bought 64 acres of woodland, at \$46.34½ per acre; 296 acres of meadow-land, at \$59.46¼ per acre; and 37 acres of low-land, at \$27.83¾ per acre. What was the area of the land; what its cost; and what the average price per acre?

13. A person was appointed to a clerkship of class one, in the Treasury Department, April 6, 1871; he was promoted to second class September 21, 1871, and to third class November 9, 1871. How much salary did he receive to December 31, 1871, inclusive?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. The cost price of beef is 11½ cents per pound, and of flour 3½ cents per pound. One pound and four ounces of beef and one pound and six ounces of flour are allowed to a ration. How much will 742 rations cost at the above rates?

15. What is the amount of duty chargeable on 11,429¾ pounds of wool, valued at \$3,267.18, when the rate of duty is 10 cents per pound and 11 per cent. *ad valorem*?

16. In a county embracing a population of 98,415 persons, a tax is levied for town, county, and State purposes, amounting to \$119,346. Of this sum, a part is to be raised by a tax of 32 cents on each poll, (or person,) and the remainder by a tax of two mills on the dollar. What was the amount of property on the tax-list?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. Five persons, having claims against the Government, placed their claims in the hands of an agent for collection. A's claim amounted to \$642, B's to \$425, C's to \$284, D's to \$250, and E's to \$175; but, after the agent had deducted his fees, there was but \$1,155 left. How much did each claimant receive?

18. From a kilogram (1,000 grams) of pure gold may be coined 279 of the newly-established standard 10-mark pieces of Germany. The standard gold dollar of the United States contains, of pure gold, 23.220 troy grains. A gram is equivalent to 15.432349 troy grains. What is the intrinsic value of the German mark (the new unit of account for the German empire) expressed in terms of the United States gold dollar and its decimal subdivisions?

7.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. John Smith is a disbursing agent of the United States. January 1, 1872, there is in his hands \$11,243 84. February 1, he pays out \$3,118 93, on which he is entitled to a commission of 1½ per cent. March 1, he receives \$3,750 87. May 1, he pays out \$3,423.02, on which he is entitled to a commission of 2½ per cent.

Make a statement of his account in the frame beneath, showing balance due the United States.

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8.

Upon completing the answer to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. Who was President of the United States during the war of 1812?
21. Who was the reputed author of the Declaration of Independence?
22. Who were Patrick Henry and Benjamin Franklin?
23. Where was the first great battle of the late rebellion fought?
24. Is the Vice-President authorized to act as President during the temporary absence of the President?
25. Is the Vice-President ever entitled to a vote in the Senate; if so, when?
26. Is a person of foreign birth eligible to the office of President or Vice-President?
27. What river forms part of the boundary between the United States and Mexico?
28. Name the New England States.
29. Through what States would you pass, in a journey by railroad, by the most direct line, from Washington to New York City?
30. Where are the Green Mountains?

9.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

31. Copy the following and correct the orthography and punctuation:

Again as they aproached the redout the murderos fire of the americans many of whom were practised marksmen burst fourth and again the asailants were driven back to the landing place they Formed and advansed a 3d third time and as the amunition of the Americans was now neerly spent they succeded in geting posession of the Hill But there oponents retired in a boddy and were not persued though they sufered much frum the fire of the shiping in their retreat The vicktory of Howe might well be considered a defeet for he lost over a thowsand men in killed and wounded while the amerckan loss was knot half as great but general warren was amoung the slain the batle was as characteristic as that of Lexington a kernel comanded and three generals either searved under him or acted independantly in directing the troops.

10.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

32. Correct the following sentences:

Who do you think me to be?

James is sixteen year old, but Thomas is only twelve year.

Hence naturally arise indifference or aversion between the parties.
 Every one in the family should know their duty.
 There seems to be no other words required.
 All debts are cleared between you and I.
 He came agreeable to his promise, and conducted himself suitable to the occasion.
 Neither John or Thomas were at home.

11.

33. Answer the following letter, and fold and brief your reply :

TREASURY DEPARTMENT,
 Washington, July 8, 1872.

Hon. E. B. FRENCH.

Second Auditor of the Treasury :

SIR: I have the honor to request that you will furnish me with the following information, which I desire to use in my forthcoming report :

1. What duties are assigned by law to the Second Auditor of the Treasury ?
 2. Into what Divisions is his Bureau divided ?
 3. State briefly the work assigned to each Division.
 4. In what cases is the mother entitled to bounty and arrears of pay in preference to the father ?
 5. What is the first duty of an examiner upon receiving a claim for examination ?
 6. Give a general statement of the mode of stating a paymaster's account.
 7. What is the difference between personal items and items belonging to appropriation accounts ?
 8. Through what bureaus of the War Department are property returns received ?
 9. State the method of examining these returns.
- Very respectfully,

GEO. S. BOUTWELL, *Secretary.*

EXAMINATION No. 11—PROMOTIONS.

OFFICE OF THE SECRETARY OF THE TREASURY,
 July 9, 1872.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name ?
2. Residence ?
3. Place of birth ?
4. Date of birth ;
5. State briefly as to your education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers :

Twenty-three thousand and six.

Two hundred and three thousand one hundred and two.

Twenty millions and one, and decimal twenty-one thousandths.

10. Write at length the numbers expressed by following figures :

253,201.

1,204,301,221.

250,000.21.

26,204.3051.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give the answer immediately under the column to which it pertains:

37,640,787 95	37,640,787 95
109,741,134 10	109,741,134 10
209,464,215 25	209,464,215 25
300,226,813 42	309,226,813 42
266,027,527 43	266,027,537 43
191,087,589 41	191,087,589 41
158,356,460 86	158,356,460 86
311,533 83	311,533 83
194,572 32	194,572 32
24,709 46	24,709 46
118,248 30	118,248 30
92,718 50	92,718 50
150,476 14	150,476 14
103,880 82	103,880 82
	149,004 15
	175,111 81
	193,636 59
	269,803 41
	315,022 63
	205,217 87
	379,558 23
	384,720 19
	445,485 18
	464,546 52
	427,124 98
	337,032 62
	315,783 47
	457,919 66

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The Government, in purchasing land for a park, bought 93 acres of woodland, at \$46.34½ per acre; 176 acres of meadow-land, at \$59.46½ per acre; and 46 acres of low-land, at \$13.83¾ per acre. What was the area of the land; what its cost; and what the average price per acre?

13. A person was appointed to a clerkship of class one April 2, 1871; he was promoted to a clerkship of class two July 6, 1871, and to a clerkship of class three October 3, 1871. What salary did he receive to December 31, 1871, inclusive?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. The cost price of beef is 11½ cents per pound, and flour 3½ cents per pound. One pound and four ounces of beef and one pound and six ounces of flour are allowed to a ration. How much will 714 rations cost at the above rates?

15. There are five bidders to supply the Department with 800 tons Lehigh, 500 tons Cumberland, and 700 tons Baltimore coal. A offers Lehigh at \$6.29, Cumberland at \$4.38, and Baltimore at \$7.23. B offers Lehigh at \$6.80, Cumberland at \$4.12, and Baltimore at \$7.24. C offers Lehigh at \$6.17, Cumberland at \$4.19, and Baltimore at \$7.20. D offers Lehigh at \$6.40, Cumberland at \$4.35, and Baltimore at \$7.18. E offers Lehigh at \$6.50, Cumberland at \$4.33, and Baltimore at \$7.25. Which is the lowest bidder for the whole amount, and how much does each man's bid amount to?

16. What is the amount of duty chargeable on 2,913½ pounds of wool, valued at \$625.75, when the rate of duty is 10 cents per pound and 11 per cent. *ad valorem*?

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

17. In a county embracing a population of 98,415 persons, a tax is levied for town, county, and State purposes, amounting to \$123,418. Of this sum, a part is to be raised by a tax of 32 cents on each poll, (or person,) and the remainder by a tax of two mills on the dollar. What was the amount of property on the tax-list?

18. Five persons, having claims against the Government, placed their claims in the hands of an agent for collection. A's claim amounted to \$625, B's to \$425, C's to \$275, D's to \$250, and E's to \$175; but after the agent had deducted his fees there was but \$1,025 left. How much did each claimant receive?

7.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

20. John Smith is a disbursing agent of the United States. January 1, 1872, there is in his hands \$11,870.63. February 1, he pays out \$3,220.34, on which he is entitled to a commission of $1\frac{3}{4}$ per cent. March 1, he receives \$3,750.87. May 1, he pays out \$4,763.82, on which he is entitled to a commission of $2\frac{1}{2}$ per cent.

[illegible]

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

21. Who was President of the United States during the war of 1812?
22. Who was the reputed author of the Declaration of Independence?
23. Who were Patrick Henry and Benjamin Franklin?
24. Where was the first great battle of the late rebellion fought?
25. Is the Vice-President authorized to act as President during the temporary absence of the President?
26. Is the Vice-President ever entitled to a vote in the Senate; if so, when?
27. Is a person of foreign birth eligible to the office of President or Vice-President?
28. What river forms part of the boundary between the United States and Mexico?
29. Through what States would you pass, in a journey by railroad, by the most direct route, from Washington to New York City?
30. Where are the Green Mountains?

9.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answer must be given immediately under the question.

31. Copy the following and correct the orthography and punctuation :

Again as they aproached the redout the murderos fire of the americans many of whom were practised marksmen burst fourth and again the asailants were driven back to the landing place they Formed and advansed a 3d time and as the amunition of the Americans was now neerly spent they succeded in geting posession of the Hill But their oponents retieed in a boddy and were not persued though they sufered much frum the fire of the shiping in their retreat The vicktory of Howe might well be conidered a defeet for he lost over a thowsand men in killed and wounded while the amerckan loss was knot half as great but general warren was amoung the slain the batle was as car-acteristic as that of Lexington a kernel comanded and three generals either searved under him or acted independantly in directing the troops.

10.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

32. Correct the following sentences :

Who do you think me to be ?

James is sixteen year old, but Thomas is only twelve year.

Hence naturally arise indifference or aversion between the parties.

Every one in the family should know their duty.

There seems to be no other words required.

All debts are cleared between you and I.

He came agreeable to his promise, and conducted himself suitable to the occasion.

Neither John or Thomas were at home.

11.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

33. Answer the following letter, and fold and brief your reply :

WASHINGTON, D. C., July 1, 1872.

Hon. GEO. S. BOUTWELL, *Secretary of the Treasury* :

SIR : I have the honor to request that you will furnish me with an answer to the following questions for use in the preparation of a report to be made to Congress at the ensuing session :

1. What is the difference between a repayment of money into the Treasury and a deposit of revenues ? Explain the process by which each is brought upon the books.

2. Who signs the commissions of persons appointed by the President by and with the advice and consent of the Senate ?

3. What is the difference between *ad valorem* and specific duties ? Are both kinds ever levied on the same articles at the same time ?

4. How are appropriations made by Congress rendered available upon the books of the Treasury, and how are they drawn therefrom in settlement of accounts against the Government ?

5. Do the laws of the United States discriminate for or against foreign vessels in the coastwise carrying trade, and how, and in what respect ?

6. By what process does the coin made at the mint of the United States find its way into the general account of the Treasnrer of the United States ?

7. How are officers of the Revenue Marine Service appointed ; for what period of time ; how removed ; and what is their status in time of war ?

8. Does an appeal lie to the Secretary of the Treasury, from the decision of the First Comptroller, in a question of account ?

9. How are the proceeds of Government property disposed of, and can it be again used for the purchase of other property without being appropriated by Congress ?

Very respectfully,

JOHN DOE, M. C.,
126th Dist., New York.

DEPUTY COMPTROLLER OF THE CURRENCY,
August 2, 1872.

1.

2.

Bills payable, \$4,528,191.12; specie, \$13,252,998.17; premiums paid, \$5,500,890.17; dividends unpaid, \$4,540,194.61; notes and bills re-discounted, \$3,964,552.57; three per cent. certificates, \$27,502,069.81; loans and discounts, \$831,552,210.00; undivided profits, \$42,008,714.38; current expenses, \$6,153,370.29; capital stock, \$458,255,696.00; individual deposits, \$600,868,486.55; real estate, furniture, and fixtures, \$30,089,783.85; legal tenders and fractional currency, \$109,083,150.98; surplus fund, \$101,112,671.91; United States deposits, \$20,511,935.98; United States bonds to secure circulation, \$364,475,800.00; due to national banks, \$131,730,713.04; due from redeeming agents, \$83,878,608.84; United States bonds to secure deposits, \$28,087,500.00; checks and other cash items, \$14,058,268.86; United States bonds and securities on hand, \$17,753,650.00; due to State banks and bankers, \$40,211,971.67; stocks, bonds, and mortgages on hand, \$24,517,059.35; due from national banks, \$43,525,362.05; national bank notes outstanding, \$315,519,117.00; exchanges for clearing-house, \$101,165,854.52; deposits of United States disbursing officers, \$5,393,598.89; bills of national banks, \$14,197,653.00; State-bank notes outstanding, \$1,921,056.00; and due from State banks and bankers, \$12,772,669.83.

[illegible]

3.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

9. How much gold, at $114\frac{1}{8}$, must be sold to purchase \$213,350 in registered 5-20 bonds of 1862, at $115\frac{5}{8}$?

10. The legal-tender circulation of the United States is \$356,000,000. What is the amount of its depreciation relatively to gold, when gold is at a premium of $14\frac{1}{8}$?

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

11. \$4,483.43 $\frac{3}{10}$ is the simple interest on \$143,215.25, at 7 per cent. per annum, for what time, reckoning 360 days to the year?

12. The population of the United States is about 38,500,000—of the Eastern States about 3,500,000; of the Middle States, about 8,900,000; of the Southern States, including the District of Columbia, about 9,100,000; and of the Western States and Territories, about 17,000,000. The amount of national currency authorized by law is \$354,000,000. If the apportionment should be made on the basis of population alone, to how much national-bank circulation would each section be entitled?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

13. A bank offers to discount a note of \$101,515.62 $\frac{1}{2}$, payable three months after date, for either six per cent., bank discount, or six and one-sixteenth per cent., true discount. Which is the better offer, and how much would be saved by accepting it in preference to the other?

14. The following is a quarterly report of the resources and liabilities of a national bank in Albany, New York. Compute the lawful money reserve which it should have on hand, and state whether its reserve is more or less than the lawful amount, and give the amount of the excess or deficiency.

Resources.		Liabilities.	
Loans and discounts	\$522,024 91	Capital stock	\$200,000 00
Overdrafts	6,015 20	Surplus fund	100,000 00
U. S. bonds to secure circulation	198,000 00	Undivided profits	79,261 10
U. S. bonds to secure deposits	100,000 00	National-bank notes outstanding	177,500 00
U. S. bonds and securities on hand		State-bank notes outstanding	
Other stocks, bonds, and mortgages	8,400 00	Dividends unpaid	
Due from redeeming agents	246,041 98	Individual deposits	590,590 45
Due from other national banks	62,230 20	U. S. deposits	40,060 30
Due from State banks and bankers	3,461 77	Deposits of U. S. disbursing officers	1,460 02
Real estate, furniture, and fixtures	35,300 00	Due to national banks	169,716 21
Current expenses		Due to State banks and bankers	79,859 96
Premiums paid	6,986 79	Notes and bills rediscounted	
Checks and other cash items	70,971 35	Bills payable	
Exchanges for clearing-house	67,348 06		
Bills of other national banks	7,693 00		
Fractional currency	3,974 78		
Specie			
Legal-tender notes	100,000 00		
Three per cent. certificates			
Total	1,438,448 04	Total	1,438,448 04

6.

ORTHOGRAPHY, SYNTAX, AND PUNCTUATION.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answer must be given immediately under the question.

15. Copy the following, and correct the orthography, syntax, and punctuation :

Up to this pint the effecks of a paper currincy is substancialy the same wether they are convertable into speeci or not, it is wen the metals has been compleatly superceded and drove from cirkulacion that the diference between convertable and incontrovertable paper begin to be oppurative. Wen the gold or sylver have all gone from cirkulation and an equal quantity of paper have taken their place supose that a stil ferther issu is superaded the same ceries of of phenomena recommence prices raise among the rest the price of gold and sylver articles and they become an object as before to prokur coin in order to convert them into bulyon. Their is no longer eny coin in cirkulation but if the paper curincy are convertable coin may stil be obtained from the isuers in egschange for notes.

7.

History, Government, and Geography.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

HISTORY.

16. Who was the first Secretary of the Treasury of the United States ?
17. Name the Comptrollers of the Currency in the order of their incumbency.
18. When did the present suspension of specie payments take effect ?
19. What was the proceeding known as "the removal of the deposits," and in the administration of what President did it occur ?
20. What is the "Independent Treasury" system ; why is it so called, and when did it go into operation ?

GOVERNMENT.

21. Where must bills for raising the revenue of the United States originate ?
22. To whom is the power to coin money delegated and to whom denied by the Constitution ?
23. In what way only can money be drawn from the Treasury of the United States under the Constitution ?
24. What only, under the Constitution, can the States make a tender in payment of debts ?

GEOGRAPHY.

25. Name the States of the Union, giving the Eastern, the Middle, the Southern, the Western, and the Pacific States separately.

8.

BANKING, GENERALLY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

26. Mention the distinctive features of the Safety Fund Banking system, and the Free Banking system of the State of New York, and of the Suffolk Bank system of the State of Massachusetts, or, if not familiar with those systems, describe that of any State with which you are acquainted.

27. What are the principal features of the business of a bank ?

28. What are the functions of a clearing-house for banks ? Describe the mode of effecting clearances at the New York clearing-house.

9.

NATIONAL BANKING SYSTEM.

Upon completing the answers to the questions, the candidate should note on the paper

the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

29. Give the dates of the approval of the National Currency acts and principal amendments.

30. State concisely the distinctive features of the National Banking system.

31. How much national currency was first authorized; how much can now be legally issued, and on what security; and by whom and on what principle is it distributed among the several States and Territories?

32. Describe the process of organizing a National Bank.

33. How, by whom, and for what period is the Comptroller of the Currency appointed, and how and by whom can he be removed?

34. In payment of what dues and demands is National Currency receivable? Is it a legal tender in payment of debts?

35. What is the meaning of the term "lawful money reserve," and what are the requirements of law in regard to it?

36. By what is the rate of interest which a National Bank may lawfully charge on a loan, or a discount, governed?

37. What reports are National Banks required to make to the Comptroller of the Currency?

38. What are the requirements of law in regard to the surplus funds of National Banks?

39. What security does the National Banking system furnish to the holders of circulating notes of National Banks; and what, if any, to their depositors and other creditors?

40. What are the steps which the law requires should precede the appointment of a receiver of a National Bank?

41. For what violations of law is a National Bank liable to forfeit its charter?

10.

PRACTICE OF THE OFFICE.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

42. Should "premiums paid" and "expenses" be classed as liabilities or as resources? Why?

43. Describe the papers required to be executed in organizing a National Bank?

44. Describe the course which you would pursue in making an examination of the condition of a National Bank.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

45. Write a letter to the Secretary of the Treasury, of not less than a page and a half in length, expressing your views concerning the National Banking system, and pointing out what, in your opinion, are the advantages and defects of the system, and fold and brief it.

EXAMINATION No. 13.—ADMISSION.

TREASURY DEPARTMENT, *October 11, 1872.*

Preliminary.

1

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?

2. Residence?

3. Place of birth?

4. Date of birth?

5. State briefly as to your education.

6. What subsequent experience in business or profession?

7. What clerical experience?

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

8. Write in figures the following numbers:

One thousand and ten.

Eighty-six thousand four hundred and eleven.

Three hundred and three thousand, and decimal five-thousandths.

9. Write at length the numbers expressed by following figures:

56,602.

35,407,501.

37.707.

45,404.303.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

10. Add the following columns of figures, and give each answer immediately under the column to which it pertains:

37,640,787	95
109,751,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,680	82
149,004	15

37,640,787	95
109,741,134	10
209,464,215	25
309,226,713	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	73
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,880	82
149,004	15
175,111	81
193,636	59
269,803	41
315,022	36
205,217	87
379,558	23
384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47
457,919	66
509,113	37

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

11. A quartermaster bought $56\frac{1}{2}$ cords of hard wood, at $6.62\frac{3}{4}$ a cord, and $37\frac{3}{8}$ cords of soft wood, at \$5.50 a cord, and issued $23\frac{1}{2}$ cords of hard, and $20\frac{3}{4}$ cords of soft wood. What was the total cost, and how much remained on hand?

12. What is the interest on \$150,580 for nine months and eleven days, at 7 per cent. a year?

5.

Upon completing the answers to the questions, the candidate should note on the paper

The answers must be given immediately under the questions to which they pertain.

19. Of what nationality were the first settlers of New York City?
20. What Presidents have been elected for two terms of office?
21. Whom does the Constitution authorize to make treaties of peace?
22. By what instrument or fundamental law was the United States governed previously to the adoption of the Constitution?
23. What two ranges of mountains are there in California?
24. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answer must be given immediately under the question.

25. Copy the following and correct the orthography and punctuation :

To a carefull and atentiv obzurver of human nacher the histery of mankind presents an interresting and instructiv but mournfull piccher, it teaches him that mann is every-where the same; but however the pickehar may be varyd by sercomstances however diferent the lite in which it is vued the leading feachers remane ever the same, In no porshun of aintient histerry air we moar struck with this important fact than in that of rome, in considering the manors of that poeple grate cair should be taken that we do not purmit the clasycal asociations of our boyhood to giv us a to faverabel oppinyon of there caracter; and agen that we du not run intoo the oposit butt less probibel eror of depresheating there reel worth, Cold indede must be the hart and dul the understanding that can contemplate unmooved the histerry of the eternal citty wich after al has dun its part toards communicating to the world civvilisation and filosofy.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

26. Correct the following sentences :

Fifty pounds of wheat contains forty pounds of flour.

There are many faults in spelling which neither analogy or pronunciation justify.

Many writers are frivolously rich in style, but wretched poor in sentiment.

They, who much is given to, will have much to answer for.

His brothers offense will not condemn him.

Nothing never effected her so much as this misconduct of her child.

When the judge dare not act, where is the losers remedy ?

None of his friends are more beloved than him.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

27. Write a letter, upon any subject with which you are familiar, of not less than one page and a half in length, and fold and brief it.

EXAMINATION No. 14. —ADMISSION.

TREASURY DEPARTMENT, *October 12, 1872.*

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to your education?
6. What subsequent experience in business or profession?
7. What clerical experience?

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

8. Write in figures the following numbers:

Five thousand and ten.

Sixty-two thousand five hundred and ten.

One thousand and three, and decimal three ten-thousandths.

9. Write at length the numbers expressed by following figures:

500,500.

68,759,205.

83.308.

110,110.110.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

10. Add the following columns of figures, and give each answer immediately under the column to which it pertains:

37,640,787	95
109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,880	82

37,640,787	05
109,731,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
103,880	82
149,004	15
175,111	81
193,636	59
269,803	41
315,022	36
205,217	87
379,559	23
384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47
457,919	66

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

11. The Treasury Department bought on contract 350 reams of foolscap paper, at \$3.83 $\frac{1}{2}$ per ream, 45 $\frac{1}{2}$ reams of which were returned as unsuitable, and 275 reams of let-

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

19. To what nation did Louisiana belong previously to its cession to the United States?

20. Who was the reputed discoverer of the Mississippi River?

21. Under what circumstances may the privilege of the writ of *habeas corpus* be constitutionally suspended?

22. Can either House of Congress adjourn without the consent of the other?

23. How many States and how many Territories are there in the United States?

24. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

25. Copy the following and correct the orthography and punctuation:

John paul jones or as he was comonly called paul jones was transfered in may 1776 from the alfred to the comand of The providence a vessell mounting twelve guns and haveing on bourd seventy men in this he maid sixteen prizes in little more than thre weeks he wus allso twice chast by british men of war but escaped by strattagem and superiour sayling in 1777 while the british were takeing posesion of philadelphia and gates was spreding a nett for burgoyne paul jones was in france endeavoring through the inflewence of the american comiissioners franklin deane and lee to get the comand of a larger and beter vesell than any the americans had in the servis.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

26. Correct the following sentences:

John regards neither the master nor the pupil's advantage.

These are the men whom, you might suppose, were authors of the work.

Neither wealth or honor can secure the happiness of their votaries.

The rapidity of his movements were beyond example.

These sort of men cannot give account of their faith.

The difference between him and I is not very great.

Does that boy know who he speaks to?

He was exceeding careful not to give offense.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

31. Write a letter upon any subject with which you are familiar, of not less than one page and a half in length, and fold and brief it.

EXAMINATION No. 15.—ADMISSION.

TREASURY DEPARTMENT, October 14, 1872.

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State, briefly, as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

8. Write, in figures, the following numbers:

Two thousand and eight.

Twenty-seven thousand three hundred and nine.

Two hundred thousand and three, and decimal thirty-three ten-thousandths.

9. Write at length the numbers expressed by following figures:

25,602.

16,307,902.

22,221.

28,202.0307.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

10. Add the following columns of figures, and give each answer immediately under the column to which it pertains:

37,640,787 95	37,640,787 95
109,741,144 10	109,741,134 10
209,464,215 25	209,464,215 25
309,226,813 42	309,226,813 42
266,027,537 43	266,027,537 43
191,087,589 41	191,087,589 41
158,256,460 86	158,356,460 86
311,533 83	311,533 83
194,272 32	194,572 32
24,709 46	24,709 46
118,248 30	118,248 38
92,718 50	92,718 50
150,476 14	150,476 14
	103,880 82
	149,004 15
	175,111 81
	193,636 59
	269,803 41
	315,022 36
	205,217 87
	379,558 23
	384,720 19
	445,485 18
	464,546 52
	427,124 98
	337,032 62
	315,783 47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

11. The Treasury Department sold for \$2,240 a lot of building materials for which it paid \$3,360. What was the percentage of loss on the cost price?

12. The quartermaster at West Point bought 10,123 bushels of oats, (32 pounds to

the bushel,) at $2\frac{1}{4}$ cents per pound; 214 tons of hay (2,000 pounds to the ton,) at $1\frac{1}{2}$ cents per pound; and 34 tons of rye straw, at $\frac{3}{4}$ of a cent per pound. What amount was paid for the whole, after deducting 15 per cent. for losses in delivery?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

13. A cord of wood is 8 feet long, 4 feet broad, and 4 feet high. What is a pile of wood 19 feet long, 11 feet 5 inches high, and 8 feet 7 inches broad worth, at \$5.62½ per cord?

14. What amount in greenbacks will it take to pay a note of \$3,750.87, payable in gold, when gold is selling at 13 $\frac{3}{8}$ cents premium on the dollar?

15. What would be the interest, at 9 per cent. per annum, on \$11,823.32 for 7 months and 13 days?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

16. The duty on Brussels carpets, wrought by the Jacquard machine, is 44 cents per square yard, and in addition thereto 35 per cent. *ad valorem*, (or upon the value.) What would be the entire amount of duty chargeable on a roll measuring 2 feet 10 inches wide, 40 yards long, and valued at \$1.50 per yard?

17. The United States engineer at New York advertised for proposals for dredging 22,340 cubic yards of earth from the harbor. How much would it cost to perform the work, at $11\frac{1}{2}$ cents per cubic foot?

7.

ACCOUNTS.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

18. A certain merchant, John Bond, borrowed of William Thompson, a fellow-merchant, on January 29, 1870, 1,638 gallons of brandy worth \$3.50 per gallon, to be repaid by brandy of similar value, but 10 per cent. to be added for such amount as was not repaid within a year. Bond made such repayments, as follows: 118 gallons on July 10, 1870; 410 gallons on November 15, 1870; 290 gallons on January 28, 1871; 310 gallons on February 13, 1871; and 285 gallons on April 25, 1871.

Make on form below a statement of the account as it stood after the last installment.

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

19. What two noted Polish generals fought for this country during the Revolutionary war?

20. Who commanded the Mexican army when the city of Mexico was taken by General Scott?

21. Can a person of foreign birth be elected President of the United States?

22. Into what three co-ordinate branches is the Government of the United States divided?

23. Where is Lake Champlain?

24. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

25. Copy the following and correct the orthography and punctuation:

Their is nothing moore certen than this that the erlier we can traice back enny won languidge the more ful compleat and consistant air its form; that the later we find it egzisting the moar compressed colloquiel and busines-like it has become, Like the treas off our forrests it grows at furst wild lugzhoorient ritch in foliage full of life and shaddow and flings abroad in its vast branches the froot of a yoothfull and viggerus nacher; transplanted to the gardin of civvillisation and traned for the purposes off commerse; it becomes reggulatied trimmed prooned; nachur indede givs it life but art prescribes the direckshun and extent of its vegetation. Allways we perceive a com-preshun a graddual loss of fine distineshuns a perrishing of forms turminashuns and conjugations in the younger stait of the languidge.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

26. Correct the following sentences:

The inquisitive and curious is generally talkative.

True rhetoric and sound logic is very near allied.

Rebecca took goodly raiment and put them on Jacob.

Neither Roman or Saxon have added anything to his categories.

The chasm was twenty foot broad.

These sort of fellows are very numerous.

Where are you going at?

Wisdoms precept's forms the good mans happiness.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

31. Write a letter, upon any subject with which you are familiar, of not less than one page and a half in length, and fold and brief it.

EXAMINATION No. 16.—ADMISSION.

TREASURY DEPARTMENT, *October 15, 1872.**Preliminary.*

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

8. Write in figures the following numbers:

Ten thousand and ten.

One hundred thousand and one hundred.

One hundred thousand, and one hundred-thousandth.

9. Write at length the numbers expressed by following figures:

79,702.

65,000,001.

502.502.

1,000,001.000001.

3.

Upon completing the answers to the questions, each candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

10. Add the following columns of figures, and give each answer immediately under the column to which it pertains:

109,741,134	10	109,741,134	10
209,464,215	25	209,464,215	25
309,226,813	42	309,226,813	42
266,027,537	43	266,027,537	43
191,087,589	41	191,087,589	41
158,356,460	86	158,356,460	86
311,533	83	311,533	83
194,572	32	194,572	32
24,709	46	24,709	46
118,248	30	118,248	30
92,718	50	92,718	50
150,476	14	150,476	14
103,880	82	103,880	82
149,004	15	149,004	15
		193,636	59
		269,803	41
		315,022	36
		205,217	87
		379,558	23
		384,720	19
		445,485	18
		464,546	52
		427,124	98
		337,032	62
		315,783	47
		457,919	66
		509,113	37

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

19. What Vice-Presidents have served out the unexpired terms of Presidents?

20. Who discovered the Hudson River, and from whom did it take its name?

21. What age is required to render a person eligible as President of the United States?

22. Who presides over the Senate during the trial of the President on impeachment?

23. What lake forms part of the boundary between New York and Vermont?

24. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answers must be given immediately under the question.

25. Copy the following, and correct the orthography and punctuation:

In february 1631 a puritan minester arived in new england by the name of roger williams, he was as yet scarcley thurty years of aige he was a man of sum enlightened veiws but his temper was not properly disciplined he Was however an ardent friend of libberty, and a fo too everyy form of legal intollerence he was at furst passtor of a church in salem here haveing advanced the oppinion that a comonwealth is bound to Protect al denominashuns of christains rather more boldly than was acceptable to the massachusetts government and haveing alsew anounced some strainge oppinions with an overbareining spirrit he was tried for herecy and was sentenced to leave the province.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

26. Correct the following sentences:

I am stronger than him, though not as large.

Who did he receive that intelligence from?

He is the strongest of the two, but not the wisest.

A mans manner's frequently influences his fortune.

No, I little thought that it were him.

He had many virtues and was exceeding beloved.

I have received no information on the subject, neither from him nor his friend.

The surveyors chain is four rod long.

11.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

31. Write a letter upon any subject with which you are familiar, of not less than one page and a half in length, and fold and brief it.

EXAMINATION No. 17.—ADMISSION.

TREASURY DEPARTMENT, *October 16, 1872.*

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name ?
2. Residence ?
3. Place of birth ?
4. Date of birth.
5. State briefly as to your education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

8. Write in figures the following numbers :

Nine thousand and two.

Fifty-seven million nine hundred and three thousand four hundred and two.

One hundred and two, and decimal three-thousandths.

9. Write at length the numbers expressed by following figures :

50,104.

32,102,203.

23.202

44,004.0302.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

10. Add the following columns of figures, and give each answer immediately under the column to which it pertains :

209,464,215	25	209,464,215	25
309,226,813	42	309,226,813	42
266,023,537	43	266,027,537	43
191,087,589	41	191,087,589	41
158,356,460	86	158,356,490	86
311,533	83	311,533	83
194,572	32	194,572	35
24,709	46	24,709	46
118,248	30	118,248	30
92,718	50	92,718	50
150,476	14	150,476	14
103,880	82	103,880	82
149,004	15	149,004	15
		175,111	81
		193,636	59
		269,803	41
		315,022	36
		205,217	87
		379,558	23
		384,720	19
		445,485	18
		464,546	52
		427,124	98
		337,032	62
		315,783	47
		457,919	66
		509,113	37

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

Show the operation at length in each case.

11. A quartermaster bought $22\frac{1}{4}$ tons of hay, at \$22.50 per ton ; 159 bushels of corn, at $62\frac{1}{2}$ cents per bushel ; and $187\frac{1}{2}$ bushels of oats, at $31\frac{1}{4}$ cents a bushel. He afterwards issued $10\frac{1}{4}$ tons of hay, $87\frac{1}{2}$ bushels of corn, and $105\frac{1}{2}$ bushels of oats. How much of each remained on hand, and what was the cost of the whole ?

12. The United States purchased ground from three men. To A was paid $\$20.56\frac{1}{4}$ per acre for 10 acres; to B $\$22.50$ per acre for 5 acres; and to C $\$27.62\frac{1}{4}$ per acre for 6 acres. How much was paid for the whole, and what was the average price paid per acre?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

13. What will \$56,215.62 amount to in one year, seven months, and eleven days, at 6 per cent. interest a year?

14. On a certain invoice of 34,216 pounds of pepper there are discounts for damage, as follows: 12 per cent. on 6,190 pounds, 8 per cent. on 6,438 pounds, and 5 per cent. on 9,642 pounds. After deducting the discount, what would be the duty on the remainder at 5 cents per pound?

15. A vessel of 345 tons is chartered at 2 p. m., May 12, 1862, at \$3.37½ per ton per month, and is discharged at 9 a. m., May 26, 1862. How much must be paid for the use of the vessel?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

16. What amount in gold can be bought for \$575 in greenbacks when gold is selling at a premium of $14\frac{2}{3}$ per cent.?

17. A person owning \$12,000 in U. S. 5-20 bonds wishes to convert them into bank stock. The bank stock is at a discount of $3\frac{1}{2}$ per cent., while the bonds are at a premium of $14\frac{1}{4}$ per cent. What amount of stock, at par value, can he purchase, allowing the broker's charges for the purchase to be $\frac{3}{4}$ per cent.?

7.

ACCOUNTS.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

18. A certain merchant, John Bond, borrowed of William Thompson, a fellow-merchant, on January 29, 1870, 1,641 gallons of brandy worth \$3.70 per gallon, to be repaid by brandy of similar value, but 10 per cent. to be added for such amount as was not repaid within a year. Bond made such repayments as follows: 127 gallons on July 10, 1870; 413 gallons on November 15, 1870; 291 gallons on January 28, 1871; 310 gallons on February 13, 1871; and 383 gallons on April 25, 1871. Make on form below a statement of the account as it stood after the last installment.

[illegible]

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper

the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

19. Who commanded the American fleet at the battle of Lake Erie during the war of 1812?

20. Who commanded the American, and who the British, army at the battle of Saratoga, during the Revolutionary war?

21. Which branch of Congress has the sole power of impeachment?

22. Is the Vice-President ever entitled to a vote in the Senate; and, if so, when?

23. What river forms the boundary between Vermont and New Hampshire?

24. Bound the State or Territory of which you are a resident, and give its capital and principal rivers.

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

25. Copy the following and correct the orthography and punctuation.

When Columbus arived in spain the news of His wounderful diskoveries rappidly spred far and wide over thee country and he was every whare looked upon with respect and addmirashun ferdnand and isabella then at the citty of Barcelona recieved him with the most distinguished tokens of reguard he had brought various specimans of the producktions of what was now caled the new world and thease were exhibited to the king and quean and to the court who seamed to regarde them with wonder and admiration no oners were to grate four columbus and a powerfull fleat was placed at his comand for another voyage. this was maid in the fall of 1493 during wich columbus diskovered jamaica and a fiew other islands butt now unexpectid difacultys ocured enemys thickened around him and retarded his progres.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

26. Correct the following sentences:

Who should I meet the other day but my old friend?

Great pains has been taken to reconcile the parties.

Every man will be rewarded according to their works.

Nothing less than murders, rapines, and conflagrations employ their thoughts.

Bancrofts history is a work of great merit.

Neither the servants or the master are respected.

The amputation was exceeding well performed.

He was illy adapted to his position in life.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

31. Write a letter, upon any subject with which you are familiar, of not less than one page and a half in length, and fold and brief it.

EXAMINATION No. 18.—PROMOTION.

FOURTH AUDITOR'S OFFICE, *November 25, 1872.*

1.

Preliminary.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?

2. Residence ?
3. Place of birth ?
4. Date of birth ?
5. State briefly as to your education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers :

Twenty thousand and one.

One million two hundred and seven thousand and three.

Two hundred thousand and three, and decimal three ten-thousandths.

10. Write at length the numbers expressed by following figures :

963,201.

37,005,401.

241.417.

304,006.3002.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains :

109,741,134 10	109,741,134 10
209,464,215 25	209,464,215 25
309,226,813 42	309,226,813 42
266,027,537 43	266,027,537 43
191,087,589 41	191,087,589 51
158,356,460 86	158,356,460 86
311,533 83	311,533 33
194,572 32	194,572 32
24,709 46	24,709 46
118,248 30	118,248 30
92,718 50	92,718 50
150,476 14	150,476 14
	103,880 82
	149,004 15
	175,111 81
	193,636 59
	269,803 41
	315,022 36
	205,217 87
	379,558 23
	384,720 19
	445,485 18
	464,546 52
	427,124 98
	337,032 62
	315,783 47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

Show the operation at length in each case.

12. A commissary of subsistence bought 200 barrels of pork, at \$15.62½ per barrel; 237 boxes of hard bread, each weighing 25 pounds, at 6½ cents per pound; and 570 pounds of coffee, at 41½ cents per pound. How much did he pay for the whole, and how much remained on hand, after issuing ¾ of each.

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. During what war did Braddock's defeat take place?

21. What nation disputed with England the mastery of the western continent previous to the Revolutionary war?

22. With what nation of Africa did the United States maintain a naval war in 1815.

23. What punishment, if any, is inflicted in case of conviction on impeachment?

24. What branch of the Government is authorized by the Constitution to declare war?

25. Where is Lake Champlain?

26. In what State does the Mississippi River rise, and where does it empty?

27. Through what States would we pass in going from New York city to Chicago by the most direct line of railroad?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

Printed books however inkorect would frum there grater legability Allways be preferred too manuskript. And thare wide sirculashun would make them at once popular, standards of orthority, in all maters of anthographie and gramaticle inflection, the konfewsion. And irregularity of there speling would; acordingly powerfully tend to increse thee unsirtenty, of orthography especialy at a period when the usage of the Lerner, even was diskordent and the langwidge. Still in proees of formashun it is no dout in these, circomstances that we are to find. The explanation of the otherwise paridoxicle fact that the speling of the english Langwidge as practised by edukated persuns in the 15th & even the latter part of the 14th Century: more neerly recembles that of the present day. Than do the printed books of the sixteeuth sentury the forren printers ignorently corrupted the spelling of thare kopy books again the orthographie of thee nashun.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct the errors in syntax:

He who committed the offense you should correct, not I who am innocent.

What avail the best sentiments if persons do not live suitably to them?

John or Thomas have went to the city.

Let's you and I go.

The measure is so exceptionable that we can by no means permit it.

A christian should always act benevolent.

He relieved neither the mans' or the womans' distress.

They have been waiting this two hours.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the Board of Examiners, and fold and brief your reply:

1. Into how many divisions is the Fourth Auditor's Office divided? Give their names, and describe the duties pertaining to each division.

2. Describe an allotment in detail.

3. What becomes of a paymaster's account after it is settled in that office?

4. What is a reconciling statement?

EXAMINATION No. 19—PROMOTION.

FIFTH AUDITOR'S OFFICE, November 25, 1872.

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience.
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Twenty thousand and one.

One million two hundred and seven thousand and three.

Two hundred thousand and three, and decimal three ten-thousandths.

10. Write at length the numbers expressed by following figures:

963,201.

37,005,401.

241.417.

304,006.3002.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains:

109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14

109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
150,476	14
113,880	82
149,004	15
175,111	81
193,636	59
269,803	41
315,022	36
205,217	87
379,558	23
384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. A commissary of subsistence bought 200 barrels of pork, at \$15.62 $\frac{1}{2}$ per barrel; 237 boxes of hard bread, each weighing 25 pounds, at 6 $\frac{1}{2}$ cents per pound; and 570 pounds of coffee, at 41 $\frac{1}{2}$ cents per pound. How much did he pay for the whole, and how much remained on hand, after issuing $\frac{3}{4}$ of each?

Give the operation and result in common fractions.

13. A quartermaster bought 875 cavalry jackets, at \$6.625 each; 912 caps, at \$.875 each; and 1,000 pairs of trousers, at \$4.3125 a pair. He issued .875 of each. What was the total cost, and how many of each remained on hand?

Give the operation and result in decimal fractions.

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

Show the operation at length in each case.

14. If a paymaster receives \$150,000 from the Treasury, and fails to account for \$225 thereof, what is the percentage of loss to the Government?

15. The United States consul at Havre, in closing his accounts for the quarter, claims a balance due to him of \$58.93. He draws a draft and negotiates it through a banker, receiving five francs on the dollar on its face. If the franc be reckoned at \$.193, for what amount, in dollars and cents, must the draft be made so that he shall receive the exact equivalent (in francs) of the amount due?

16. \$6,654.58 $\frac{1}{2}$ is the interest on \$75,000 for 15 months and 7 days, at what rate per cent., reckoning 360 days to the year?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

Show the operation at length in each case.

17. What amount in gold must be sold in order to pay a note of \$7,850.62, payable in greenbacks, when gold is selling at a premium of 13 $\frac{3}{4}$ cents on the dollar?

18. The duty on burlaps is 35 per cent. ad valorem, or, upon the value. What is the amount chargeable on a bale containing 50 webs, each being 40 yards and 16 inches long, and 27 inches wide, and valued at 30 cents per yard?

7.

ACCOUNTS.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. James Smith commenced business January 1, 1871, as agent for Henry Brown, with a cash capital of \$10,000. He bought of John Jones, for cash, 600 barrels of flour, at \$10 per barrel, and of Thomas Miller 1,800 bushels of oats, at 60 cents per bushel, for which he gave his note for three months, with interest at the rate of 6 per cent. per annum; and of John Doe, for cash, 6,000 bushels of corn, at 75 cents per bushel. He sold to George Thompson, for cash, 515 bushels of oats, at 63 cents per bushel; to James Day, February 1, 1871, 313 barrels of flour, at \$10.51 per barrel, to be paid for in five months, with interest at the rate of 7 per cent. per annum; to Henry Johnson, February 15, 1871, 500 bushels of corn, at 77 cents per bushel, to be paid for in four months, with interest at the rate of 8 per cent. per annum; and to Philip Tucker, June 30, 1871, 100 barrels of flour, at \$10.25 per barrel, cash. All of the notes were paid at maturity. Make a statement of James Smith's account with Henry Brown, on the form below, as it stood after the last transaction.

--	--	--	--	--	--	--	--

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. During what war did Braddock's defeat take place?
21. What nation disputed with England the mastery of the western continent previous to the Revolutionary war?
22. With what nation of Africa did the United States maintain a naval war in 1815?
23. What punishment, if any, is inflicted in case of conviction on impeachment?
24. What branch of the Government is authorized by the Constitution to declare war?
25. Where is Lake Champlain?
26. In what State does the Mississippi River rise, and where does it empty?
27. Through what States would we pass in going from New York City to Chicago by the most direct line of railroad?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

Printed books however inkorect would frum there greater legability Allways be preferred too manuskript. And thare wide sirculashun would make them at once popular, standards of orthority, in all matters of authographie and gramaticle inflection, the konfewsion. And irregularity of there speling would; accordingly powerfully tend to increase the unsirtenty, of orthography especialy at a period when the usage of the Lerner, even was diskordent and the langwidge. Still in proces of formashun it is no dout in these, circomstanses that we are to find. The explanation of the otherwise paridoxicle fact that the speling of the english Langwide as practised by ednkated persuns in the 15th & even the latter part of the 14th Century: more neerly recembles that of the present day. Than do the printed books of the sixteenth sentury the forren printers ignorently corrupted the spelling of thare kopy and there books again the orthographie of thee nashun.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct the errors in syntax:

He who committed the offense you should correct, not I who am innocent.

What avail the best sentiments if persons do not live suitably to them?

John or Thomas have went to the city.

Let's you and I go.

The measure is so exceptionable that we can by no means permit it.

A Christian should always act benevolent.

He relieved neither the mans' or the womans' distress.

They have been waiting this two hours.

LETTER AND BRIEF.

11.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply:

1. State what accounts are rendered by collectors of internal revenue, and how rendered.

2. State what is the compensation of a collector and how it is paid, and what he is required to do before being installed in office.

3. To what periods are the regular accounts of assessors of internal revenue rendered, how are they paid and adjusted, and what items do they include?

4. What commissions are allowed to stamp-agents and to purchasers of stamps?

5. Under what circumstances are consuls allowed more salary than the sum appropriated by Congress?

6. In what parts of the world are consuls authorized to perform diplomatic functions?

7. What is exchange?

EXAMINATION No. 20.—PROMOTION.

SECOND AUDITOR'S OFFICE,
December 4, 1872.

Preliminary.

1

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?

2. Residence?

3. Place of birth?

4. Date of birth?

5. State briefly as to your education.

6. What subsequent experience in business or profession?

7. What clerical experience?

8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Thirty-two thousand and sixty.

Four millions two thousand and six.

Six hundred and one millions, twenty-five thousand, three hundred and one, and decimal eleven hundred-thousandths.

10. Write at length the numbers expressed by following figures:

301,500.

231,607,005.

506.0025.

249,064.00001.

3

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains :

37,640,787 95	37,640,787 95
109,741,134 10	109,741,134 10
209,464,215 25	209,464,215 25
309,226,813 42	309,226,813 42
266,027,537 43	266,027,537 43
191,087,589 41	191,087,589 41
158,356,460 86	158,356,460 86
311,553 83	311,553 83
194,572 32	194,572 32
24,709 46	24,709 46
118,248 30	118,248 30
92,718 50	92,718 50
150,476 14	150,476 14
	103,880 82
	149,004 15
	175,111 81
	193,636 59
	269,803 41
	315,022 36
	205,217 87
	379,558 23
	384,720 19
	445,485 18
	464,546 52
	427,124 98
	337,032 62
	315,783 47

4

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The standard gold dollar of the United States contains nine parts of pure gold and one part of alloy, and weighs 25.8 grains troy. How many grains of gold and alloy, respectively, are required for the coinage of 6,983 gold dollars?

13. The ordnance department sold at public auction 12,750 condemned Springfield muskets, at \$12.37½ each, the original cost of which was \$14.75 per piece; 3,075 sabers, at \$3.87½ each, which cost \$5.31½ per piece; and 100,000 rounds of cartridges for \$5,000, the original cost being \$1.25 per 100 rounds. What was the total original cost, and what was the amount realized?

Give the operation and result in common fractions.

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. The duty on spool thread of cotton, containing 100 yards to the spool, is 6 cents per dozen spools, and in addition thereto 30 per cent. ad valorem, (or upon the value.) What is the amount chargeable on 11,153 spools, valued at 3 cents a spool?

15. A transport was hired to carry 315 tons of Government stores from New York to Charleston, at the rate of \$3.3125 per ton per month. The vessel left New York at 2 o'clock August 16, 1871, and reached Charleston on the 21st of the same month at 11 o'clock a. m. How much pay was due, allowing 30 days to the month?

Give the operation and result in decimal fractions.

16. What time is required for \$25,250 to gain \$5,162.22½, at the rate of 8 per cent. interest per annum, reckoning 360 days to the year?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. A paymaster made the following payments to the regiments of a brigade, to wit, to the first regiment, \$10,000; to the second, \$9,500; and to the third, \$8,575.62. Of these amounts \$2,500, \$2,275, and \$1,850 were, respectively, suspended for informalities in the vouchers. What was the per cent. of suspensions on each payment, and on the total amount paid?

18. Calvin Hale pays \$7,350 in currency for Indian goods worth \$6,345, at gold prices. What is the premium on gold; what is gold worth in currency; and what is currency worth in gold?

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. Where was the first permanent English settlement made in the United States?

21. Name the thirteen original colonies.

22. When was the second war between this country and Great Britain declared, and for what reason?

23. Is the President authorized ever to adjourn both houses of Congress; and if so, under what circumstances?

24. How may the Constitution be amended?

25. In the following list, state which are sea-ports, and which inland cities; Albany, Charleston, (South Carolina,) Raleigh, Atlanta, Savannah, Portland, and Hartford.

26. What rivers unite and form the Ohio?

27. What are the principal tributaries of the Mississippi River?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of orthography and punctuation, but not otherwise altering either the words or their order:

the inflewence of printing upon the english landgwide has bin much extended and strengthened by to importent sircumstances comon to thee two grate countrys of which it is the virnackuler the one is that in neather does their. Exist nor for senturies has thare existed a sencership of the Press a previus orthoritative examinashun of manuskript matter intended for The Publick;—the other is that publick diskussion of all questions in the departments of relegion of intellectual and morral filosofy of Pollyticks indede; of awl topics afecting the grate and purminant interests of man; is free and unrestricted hence the populer mind the populer speach in both countries are open to a class of inflewences whitch in moste Continentle Staits are confined to the priviledged and professional alone.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct the errors in syntax:

The rapidity of his movements were beyond example.

The wall is ten foot high.

I have neither Johns or Williams' book.

Which of those two cords is the stronger?

Who did you go with?

The sight appeared terrible to me.

I can learn him many things.

He done me no harm, for I had wrote my letter before he come home.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note upon the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply:

1. How is money advanced and charged to a disbursing officer?
2. If an Indian agent should purchase goods without authority, and should fail to account for them on his property return, what would you do on auditing his accounts?
3. If on examination of an officer's returns it is found that certain articles of clothing are unaccounted for, what action is taken in the matter?
4. What are appropriation items?
5. What are the duties of the division of inquiries and replies?
6. Where two brothers have made application, in form, for the arrears of pay and bounty due a deceased brother, and a treasury certificate for the amount due has been issued to them jointly, what disposition is to be made of the share of one of the brothers who has died pending settlement?
7. Which is the debit and which the credit side of an account-current rendered by a disbursing officer?
8. In stating an officer's account, do his debit and credit in his account-current correspond with the debit and credit in the statement?
9. What are the general duties of the division for the investigation of frauds?

EXAMINATION No. 21.—PROMOTION.

THIRD AUDITOR'S OFFICE, *January 4, 1873.*

Preliminary.

1.

Upon completing the answers and questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Thirty-two thousand and seventeen.

Fifteen millions two thousand and three.

Ten millions and two, and decimal twenty-three hundred-thousandths.

10. Write at length the numbers expressed by following figures:

256,002.

912,300,016.

2,321.021.

506,301.2001.

3.

Upon completing the answers to the questions, the candidate should note on the

paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains :

\$103,880 82	\$509,113 37
109,741,134 10	457,919 66
209,464,215 25	109,741,134 10
309,226,813 42	209,464,215 25
266,027,537 43	309,226,213 42
191,087,589 41	266,027,537 43
158,356,460 86	191,087,589 41
311,533 83	158,356,460 86
194,572 32	311,533 83
24,709 46	194,572 32
118,248 30	24,709 46
92,718 50	118,248 30
150,476 14	92,718 50
	150,476 14
	103,880 82
	149,004 15
	175,111 81
	193,636 59
	269,803 41
	315,022 36
	205,217 87
	379,558 23
	384,720 19
	445,485 18
	464,546 52
	427,124 98
	337,032 62
	315,783 47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. A commissary of subsistence bought 198,785 pounds of bacon, at 13.5 cents per pound ; 98,000 pounds of flour, at \$14.375 per barrel, (196 pounds to the barrel ;) 19,800 pounds of coffee, at 37.5 cents per pound ; and 497 gallons of vinegar, at 44.75 cents per gallon. What was the total cost of the purchases ?

Give the operation and result in decimal fractions.

13. A disbursing officer deposited in the Treasury \$23,914.59, having retained 1% per cent. on the amount collected. What amount did he collect ?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. If the duty on a lot of sugar weighing 1,639,728 pounds is $2\frac{3}{4}$ cents per pound, and there is a discount of $7\frac{1}{2}$ per cent. allowed for damage, what amount of duty must be paid ?

Give the operation and result in common fractions.

15. The weight of the United States gold double-eagle is 1.075 ounces troy. The intrinsic value of standard gold is $15\frac{6}{10}$ times that of an equal weight of standard silver, and the weight of a silver dollar is .859375 ounces troy. What is the intrinsic value of the silver dollar expressed in terms of the gold dollar and its decimal subdivisions ?

16. On a promissory note which has run 3 years, 7 months, and 7 days, at the rate of 7 per cent. per annum, \$126.09 $\frac{3}{8}$ interest has accrued. What is the amount of the note, reckoning 360 days to the year ?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. A quartermaster paid for transporting 131,215 pounds of hard bread a distance of 81 miles $2\frac{1}{2}$ cents per ton per mile; 513 enlisted men, 163 miles, $2\frac{1}{2}$ cents per mile for each man. He also paid \$500 per day for the use of a steamer from May 3 to September 2, 1864, (both days inclusive.) What was the total amount of the payments?

18. What amount in gold must be sold at a premium of $12\frac{3}{4}$ cents on the dollar in order to purchase \$16,750 in coupon ten-forty bonds at a premium of $10\frac{1}{2}$ per cent?

7.

ACCOUNTS.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. Thomas Jones is a disbursing officer of the United States. On the 1st of January, 1872, there was advanced to him \$6,000; on the 1st of April, 1872, \$2,500; on the 15th of May, 1872, \$1,761; and on the 1st of June, 1872, \$550.59. He has made disbursements to the amount of \$10,156; on \$5,000 he is entitled to a commission of $\frac{3}{4}$ per cent.; on \$3,000 to a commission of $\frac{3}{4}$ per cent., and on the remainder to a commission of 1 per cent.

State the account of the United States with Thomas Jones in the frame beneath.

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8

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. During what war did the battle of Buena Vista take place?

21. What American general was killed at the battle of Bunker Hill?

22. When and where did General Robert E. Lee surrender?

23. What is the highest judicial tribunal in the United States?

24. When is the electoral vote cast?

25. Where is the island of San Juan?

26. Name the States and Territories lying on the northern frontier of the United States, extending from the Atlantic to the Pacific Ocean.

27. In the following list, state which are sea-ports and which inland cities: Boston, Tallahassee, Baton Rouge, Saint Augustine, Nashville, Syracuse, and Des Moines.

9

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

The deliberate expresion of human thawt; will allways asume A form, suposed to be adaptid. to the inteligence the tempur the taists and the ames; of those to whome it is addresed, he who speaks to an Audyence komposed of men of won clas. of won profesion of won party or of won sect will use a narrower vokabulary a more. Restrikted or a more sealect dyalect than he who expects too be hurd by a more varius and komprehensive. Surcle and a riter who appeals to a hole Peple who seeks to convince the understanding or inlist the sympathy's of a nation; must adopt a dicktion Employ arguements. And resort to ilustrations which shal; in there turn sute the comprehenshun and; Awaken the interest of men of every class and every kalling, whatever theirfore is desined for the ear or the perewsal of what we call the inlightened publick must be as miscelaneus in its composishun as that publick itself. And it can come home to the busums of awl only by useing both the speach which is comon too all and sunwhat of the special vokabulary which is pekulier to each.

10

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct such as contain errors in syntax:

I sold my horse and buggy for less than it cost.

The discomfiture and slaughter were very great.

Neither riches nor honors can satisfy an immortal spirit.

The Chinese wall is thirty foot high.

He was the greatest statesman of the two.

It cannot be me.

Did not Mary look most beautifully at the lecture?

Prudence and not pomp are the basis of his fame.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply:

1. What accounts are settled in the Third Auditor's Office?

2. What officer revises the accounts settled by the Third Auditor?

3. What is the force and effect of the Third Auditor's decision in any case? Has he any power to instruct or control disbursing officers, and can he make final decisions?

4. What military officers are allowed to disburse public money who are not required to give bonds?

5. Describe the character of the authorized expenditures made by pension agents?

6. What abstracts are used in rendering the accounts of disbursing commissaries of subsistence which are settled by the Third Auditor? Describe the purposes for which each is used.

7. What abstracts are used in rendering the accounts of officers of the Engineer Department? Describe the purpose for which each is used.

8. What evidence is required to authenticate a claim for property purchased or taken during the war of the rebellion, and what officer's approval is required to permit its allowance by the accounting officers?

9. What does the "general account of money advanced" show?

EXAMINATION No. 22.—PROMOTION.

FIRST COMPTROLLER'S OFFICE,
January 23, 1873.

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name ?
2. Residence ?
3. Place of birth ?
4. Date of birth ?
5. State briefly as to your education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Fifty-three thousand and two.

Twenty-three millions five thousand and twenty-one.

Four hundred millions and six, and decimal one hundred and twenty-three hundred-thousandths.

10. Write at length the numbers expressed by following figures :

247,601.

971,345,201.

275.0301.

1,275,630.10003.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains :

\$109,741,134 10	\$109,741,134 10
209,464,215 25	209,464,215 24
309,226,813 42	309,226,813 42
266,027,537 43	266,027,537 43
191,087,589 41	191,087,589 41
158,356,490 86	158,356,460 86
311,533 83	311,533 83
194,572 32	194,572 32
24,709 46	24,709 46
118,248 30	118,248 30
92,718 50	92,718 50
150,476 14	150,476 14
	103,880 82
	149,004 15
	175,111 81
	193,636 59
	269,803 41
	315,022 36
	205,217 87
	379,558 23
	384,720 19
	445,485 18
	464,546 52
	427,124 98
	337,032 62
	315,783 47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. A person having invested \$10,000 in six per cent. stocks at par, sold out at the end of the year at 92½, and invested the proceeds in 5 per cents. at 65. What was the difference in his annual income, and in favor of which kind of stock?

13. Two persons invested in United States 7.30 notes \$1,600, and selling them in the market cleared \$300. The gain and stock of one amounted to \$1,140. What were the respective shares of the common stock, and also of gain of each of the parties?

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. A person residing in New Orleans owed me \$500, and sent me a draft for the exact amount, which cost me ¾ per cent. to get cashed. How much does he still owe me, and for what sum should the draft have been made to net me \$500?

15. In adjusting the accounts of internal-revenue collectors, as an item of credit for the salary prescribed by law, (\$1,500,) would two collectors who had served a fractional period of twelve days each, the one in December and the other in January of a common year, be entitled to the same amount; and if not, which would be entitled to the larger sum, and how much?

16. If the Secretary of the Treasury were to sell \$1,000,000 gold at \$1.12½, and buy the same amount of bonds at \$1.11¼, how much more is made by the transaction than if he had called the bonds, and what is the per cent. of gain?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. A consul has due him a balance of \$475, for which he desires to draw on London, exchange being at the rate of 5 per cent. loss on the face of his draft. For what amount in sterling money must he draw in order to realize the balance due him, the pound sterling being valued at \$4.84?₁₀₀?

18. A consul at a salary of \$1,500 per annum renders his account from June 20, 1872, to September 30, 1872, *both days inclusive*, and credits \$217.⁸³₁₀₀ fees received by him during said period. For what amount is he entitled to draw, exchange being at the rate of 3½ per cent. loss on the face of his draft?

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. What States seceded from the Union in the late civil war?

21. When was Abraham Lincoln assassinated?

22. Who was the first Vice-President of the United States?

23. What are Congressmen at large, and how are they elected?

24. How is the President of the United States chosen?

25. In the following list state which are rivers and which lakes: Missouri, Pontchartrain, Erie, Ohio, Colorado, and Champlain.

26. Through what rivers, lakes, and gulf do the waters of Lake Superior pass on their way to the Atlantic Ocean?

27. What States border on the Atlantic Ocean?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

Now if the revival of the english nashunality had meant the expulshun of the dominant norman race. This would verry probably have bin, the course taken. And the reactshun would have put under a kommon bann langwidge and institooshuns alike, But happily it ment know sutch thing; it ment the blending of the two rases into wun, the forming of a new english nashun, by the gradyoual coalishun of the two by the growing consciousness that this england was the equal heratage of both. The well-fair of which was the kommon interest of both; it was not on either side a tryumph or rather as are awl rekonsiliations it was on both sides a tryumph, but where under these cercumstances should a suply of the new necesitys be so naturally look for as frum the french.—That was the langwidge of one of the partys in this happy transactshun, of the one which in respect of langwidge was giving up far the most and whitch therefour might farely look for this parshal compensashun.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct such as contain errors in syntax:

Wisdom and not wealth procure esteem.

I would not act thus if I was him.

Which is the prettiest of the two?

A just man will deal justly, and a foolish man will act foolishly.

Milton is an author who I am much delighted with.

Neither John or James will send their books.

It is etiquette not to set down in the presence of royalty.

The world's government is not left to chance.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply:

1. When, and under what law, was the office of Comptroller established?

2. What are the powers and duties of the Comptroller?

3. State, in detail, the manner of obtaining a draft upon the Treasury for the amount found due upon an account rendered to the First Auditor of the Treasury, other than an account arising under the revenue collection laws?

4. Explain the difference between an ordinary pay warrant and a covering warrant?

5. Are marshals of the United States, commissioners of courts, United States attorneys, and clerks compensated by fees or salaries?

6. What are the different grades of our diplomatic and consular agents employed in foreign countries, and how are they compensated?

7. How often are collectors required to render their accounts as disbursing agents, and are they adjusted at the Department monthly or quarterly?

8. By what method can a balance be paid to a collector which has been found due to him on his revenue account?

EXAMINATION No. 23—PROMOTION.

SECOND COMPTROLLER'S OFFICE, *January 23, 1873.*

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name ?
2. Residence ?
3. Place of birth ?
4. Date of birth ?
5. State briefly as to your education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers :

Fifty-three thousand and two.

Twenty-three millions five thousand and twenty-one.

Four hundred millions and six, and decimal one hundred and twenty three hundred thousands.

10. Write at length the numbers expressed by following figures :

247,601.

971,345,201.

275.0301.

1,275,630.10003.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains :

\$109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
24,799	46
118,248	30
92,728	50
150,476	14

\$109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
158,356,460	86
311,533	83
194,572	32
25,709	46
118,248	30
92,718	50
150,476	14
103,880	82
149,004	15
175,111	81
193,636	59
269,803	41
315,022	36
205,217	87
379,558	23
384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The quartermaster at Leavenworth, Kansas, purchased 75,000 pounds of corn, at $31\frac{1}{2}$ cents per bushel, (56 pounds to the bushel ;) 32,113 pounds of oats, at $32\frac{1}{2}$ cents per bushel, (32 pounds to the bushel ;) and 79,500 pounds of hay, at $\$22.37\frac{1}{2}$ cents per ton, (2,000 pounds to the ton.) What was the total cost of the purchase ?

13. An officer of the Treasury Department collected \$17,850, and deposited \$17,493 in the Treasury, retaining the remainder as his commission. What was the rate per cent. of the commission on the amount collected?

5.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

15. What is the amount of pension payable to the widow of a private soldier at \$8 per month for herself, and \$2 per month for each of five children, from the 15th day of August, 1868, to the 21st of June, 1871, including both days, and reckoning thirty days to the month?

6.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

18. The weight of the United States double-eagle is 1.075 ounces troy. The intrinsic value of a given weight of standard gold is 15.6 times that of an equal weight of standard silver. What is the gold value of an ounce of standard silver?

7.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. A collector, on 1st of January, 1871, was indebted to the United States to the amount of \$928.50. An advance of \$420 was made to him. He paid out on account of salaries of employes, \$628.50; contingent expenses, \$42.31; for his own salary, \$62.50; and for commissions, $2\frac{1}{2}$ per cent. on \$2,400. State the collector's account with the United States in the frame beneath.

[illegible]

8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. What States seceded from the Union in the late civil war?
21. When was Abraham Lincoln assassinated?
22. Who was the first Vice-President of the United States?
23. What are Congressmen at large, and how are they elected?
24. How is the President of the United States chosen?
25. In the following list, state which are rivers and which lakes: Missouri, Pontchartrain, Erie, Ohio, Colorado, and Champlain?
26. Through what rivers, lakes, and gulf do the waters of Lake Superior pass on their way to the Atlantic Ocean?
27. What States border on the Atlantic Ocean?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

Now if the revival of the english nashunalite had ment the expulshun of the dominant norman race. This would verry probably have bin, the course taken. And the reactshun would have put under a kommon bann langwidge and institooshuns alike, But happily it ment know sutch thing; it ment the blending of the too rases into wun, the forming af a new english nashun, by the gradyoual coalishun of the two by the growing consciousness that this england was the equal heratage of both. The wellfair of which was the kommon interest of both; it was not on either side a tryumph or rather as are awl rekonsiliations it was on both sides a tryumph, but where under the cercumstances should a suply of the new necesitys be so naturally look for as from the french.—That was the langwidge of one of the partys in this happy transactshun, of the one which in respect of langwidge was giving up far the most and whitche therefour might farely look for this parshal compensashun.

10

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct such as contain errors in syntax;

Wisdom and not wealth procure esteem.

I would not act thus if I was him.

Which is the prettiest of the two?

A just man will deal justly, and a foolish man will act foolishly.

Milton is an author who I am much delighted with.

Neither John or James will send their books.

It is etiquette not to set down in the presence of royalty.

The world's government is not left to chance.

11

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply :

1. What are the duties of the Second Comptroller's Office ?
2. Under existing laws and regulations, what amounts are officers entitled to receive for commutation of quarters and fuel ?
3. What is the rate of pay of a private soldier for extra duty as now established ?
4. How many distinct classes of pensioners are there under the laws of the United States ?
5. How are they distinctively designated ?
6. How many agents for paying pensions are there in the United States ?
7. What bounty would be due a soldier who enlisted in the volunteer service July 1, 1861, for three years ; who was discharged and re-enlisted November 1, 1863, for three years, and who was mustered out May 15, 1865, his service being no longer required ?
8. What bounty would be due a soldier who enlisted in the volunteer service August 1, 1864, for three years, and who was discharged March 1, 1866, his service being no longer required ?

EXAMINATION No. 24.—PROMOTION.

FIRST AUDITOR'S OFFICE, *January 23, 1873.*

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name ?
2. Residence ?
3. Place of birth ?
4. Date of birth ?
5. State briefly as to your education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers :

Fifty-three thousand and two.

Twenty-three millions five thousand and twenty-one.

Four hundred millions and six, and decimal one hundred and twenty-three hundred-thousandths.

10. Write at length the numbers expressed by following figures :

247,601.

971,345,201.

275.0301.

1,275,630.10003.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains :

\$109,741,134 10	\$109,741,134 10
209,464,215 25	209,464,215 25
309,226,813 42	309,226,813 42
266,027,537 43	266,027,537 43
191,087,589 42	191,087,589 41
158,356,460 86	158,356,460 86
311,533 83	311,533 83
194,572 32	194,572 32
24,709 46	24,709 46
118,248 30	118,248 30
92,718 50	92,718 50
150,476 14	150,476 14
	103,880 82
	149,004 15
	175,111 81
	193,636 59
	269,803 41
	315,022 36
	205,217 87
	379,558 23
	384,720 19
	445,485 18
	464,546 52
	427,124 98
	337,032 62
	315,783 47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The quartermaster at Leavenworth, Kansas, purchased 75,000 pounds of corn, at $31\frac{1}{4}$ cents per bushel, (56 pounds to the bushel;) 32,113 pounds of oats, at $32\frac{1}{2}$ cents per bushel, (32 pounds to the bushel;) and 79,500 pounds of hay, at $\$22.37\frac{1}{2}$ cents per ton, (2,000 pounds to the ton.) What was the total cost of the purchase?

Give the operation and result in common fractions.

13. An officer of the Treasury Department collected $\$17,850$, and deposited $\$17,493$ in the Treasury, retaining the remainder as his commission. What was the rate per cent. of the commission on the amount collected?

Write the answer in words.

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. The rate of duty on certain wine being one dollar per gallon, and twenty-five per cent. ad valorem (or upon the value) and three cents on each bottle, give the total duty on 839 bottles, (each containing one quart,) and costing $\$2.93$ per gallon.

15. What is the amount of pension payable to the widow of a private soldier at $\$8$ per month for herself and $\$2$ per month for each of five children, from the 15th day of August, 1868, to the 21st of June, 1871, including both days, and reckoning thirty days to the month?

16. At what rate per cent., simple interest, must $\$1,560$ be lent to gain $\$426.83\frac{1}{2}$ in 2 years, 8 months, and 25 days, reckoning 360 days to the year?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. If seven $\$100$ United States five-twenty bonds are purchased at the following rates in currency, viz: $111\frac{1}{8}$, 112 , $113\frac{3}{8}$, $112\frac{1}{4}$, $113\frac{1}{4}$, $113\frac{1}{8}$, and $113\frac{7}{8}$, what is the average price paid, and what is the average cost in gold at 15 per cent. premium?

18. The weight of the United States double-eagle is 1.075 ounces troy. The intrinsic value of a given weight of standard gold is 15.6 times that of an equal weight of standard silver. What is the gold value of an ounce of standard silver?

Give the operation and result in decimal fractions.

7.

ACCOUNTS.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. A collector, on 1st of January, 1871, was indebted to the United States to the amount of \$927.50. An advance of \$420 was made to him. He paid out on account of salaries of employes, \$628.50; contingent expenses, \$42.31; for his own salary, \$62.50; and for commissions, 2½ per cent. on \$2,400. State the collector's account with the United States in the frame beneath.

[illegible]

20.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. What States seceded from the Union in the late civil war?

21. When was Abraham Lincoln assassinated?

22. Who was the first Vice-President of the United States?

23. What are Congressmen at large, and how are they elected?

24. How is the President of the United States chosen?

25. In the following list, state which are rivers and which lakes: Missouri, Pontchartrain, Erie, Ohio, Colorado, and Champlain.

26. Through what rivers, lakes, and gulf do the waters of Lake Superior pass on their way to the Atlantic Ocean?

27. What States border on the Atlantic Ocean?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

Now if the revival of the english nashunality had meant the expulshun of the dom-

inent norman race. This would verry probably have bin, the course taken. And the reacshun would have put under a kommon bann langwidge and institooshuns alike, But happily it ment know sutch thing; it ment the blending of the too rases into wun, the forming of a new english nashun, by the gradyonal coalishun of the two by the grow-ing consiousnes that this england was the equal heratage of both. The wellfair of which was the kommon interest of both; it was not on either side a tryumph or rather as are awl rekonsiliations it was on both sides a tryumph, but where under these cer-cumstances should a suply of the new necesitys be so naturaly look for as frum the french.—That was the langwidge of one of the partys in this happy transacshun, of the one which in respect of langwidge was giving up far the most and whitch therefour might farely look for this parshal compensashun.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

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29. Copy the following sentences, and correct such as contain errors in syntax:

Wisdom and not wealth procure esteem.

I would not act thus if I was him.

Which is the prettiest of the two?

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Milton is an author who I am much delighted with.

Neither John or James will send their books.

It is etiquette not to set down in the presence of royalty.

The world's government is not left to chance.

11.

LETTER AND BRIEF

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply:

1. What are the powers and duties of the First Auditor of the Treasury?

2. What classes of accounts are settled in his office?

3. Name the divisions into which his office is divided, and briefly describe the duties of each.

4. What is the Treasury rule for the calculation of salaries fixed by the year, for shorter periods than one year?

5. How are funds for disbursement obtained from the Treasury by disbursing agents?

6. Does an appeal lie to the Secretary of the Treasury from the decision of the First Comptroller on a question of account?

7. What is the purpose of a covering warrant?

EXAMINATION No. 25.—PROMOTION.

LOAN BUREAU, OFFICE SECRETARY OF THE TREASURY,

January 23, 1873.

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?

2. Residence?

3. Place of birth?

4. Date of birth?

5. State briefly as to your education.

6. What subsequent experience in business or profession?

7. What clerical experience?

8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers :

Fifty-three thousand and two.

Twenty-three millions five thousand and twenty-one.

Four hundred millions and six, and decimal one hundred and twenty-three hundred-thousandths.

10. Write at length the numbers expressed by following figures :

247,601.

971,345,201.

275.0301.

1,275,630.10003.

3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains :

\$109,741,134	10
209,464,215	25
309,226,813	42
266,027,537	43
191,087,589	41
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311,533	83
194,572	32
24,709	46
118,248	30
92,718	50
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311,533	83
194,572	32
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103,880	82
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175,111	81
193,636	59
269,803	41
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384,720	19
445,485	18
464,546	52
427,124	98
337,032	62
315,783	47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

Show the operation at length in each case.

12. The quartermaster at Leavenworth, Kansas, purchased 75,000 pounds of corn, at $31\frac{1}{2}$ cents per bushel, (56 pounds to the bushel;) 32,113 pounds of oats, at $32\frac{1}{2}$ cents per bushel, (32 pounds to the bushel;) and 79,500 pounds of hay, at $\$22.37\frac{1}{2}$ cents per ton, (2,000 pounds to the ton.) What was the total cost of the purchase?

Give the operation and result in common fractions.

13. An officer of the Treasury Department collected \$17,850, and deposited \$17,493 in the Treasury, retaining the remainder as his commission. What was the rate per cent. of the commission on the amount collected?

Write the answer in words.

8

HISTORY, GOVERNMENT AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. What States seceded from the Union in the late civil war?
21. When was Abraham Lincoln assassinated?
22. Who was the first Vice-President of the United States?
23. What are Congressmen at large, and how are they elected?
24. How is the President of the United States chosen?
25. In the following list, state which are rivers and which lakes: Missouri, Pontchartrain, Erie, Ohio, Colorado, and Champlain.
26. Through what rivers, lakes, and gulf do the waters of Lake Superior pass on their way to the Atlantic Ocean?
27. What States border on the Atlantic Ocean?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

Now if the revival of the english nashunality had meant the expulshun of the dominant norman race. This would verry probably have bin, the course taken. And the reactshun would have put under a kommon bann langwidge and institooshuns alike, But happily it ment know sutch thing; it ment the blending of the too races into wun, the forming of a new english nashun, by the gradyoual coalishun of the two by the growing consiousnes that this england was the equal heratage of both. The wellfair of which was the kommon interest of both; it was not on either side a tryumph or rather as are awl rekonsiliations it was on both sides a tryumph, but were under these cercumstances should a suply of the new necesitys be so naturaly look for as frum the french. —That was the langwidge of one of the partys in this happy transactshun, of the one which in respect of langwidge was giving up far the most and witch therefour might farely look for this parshal compensashun.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct such as contain errors in syntax:

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Neither John or James will send their books.

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The world's government is not left to chance.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply:

1. What are the functions of the Loan Bureau?

2. Mention the principal kinds of United States bonds.

3. State, briefly, the process of converting coupon bonds into registered stock.

4. State, briefly, what course is pursued when a United States bond has been destroyed by fire and the owner makes application to the Department for relief.

5. Describe the mode of paying interest on registered stock of the United States, generally, and on stock of the funded loan of 1881.

EXAMINATION No. 26.—PROMOTION.

OFFICE OF THE COMMISSIONER OF CUSTOMS,
January 23, 1873.*Preliminary.*

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name ?
2. Residence ?
3. Place of birth ?
4. Date of birth ?
5. State briefly as to your education.
6. What subsequent experience in business or profession ?
7. What clerical experience ?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers :

Fifty-three thousand and two.

Twenty-three millions five thousand and twenty-one.

Four hundred millions and six, and decimal one hundred and twenty-three hundred-thousandths.

10. Write at length the numbers expressed by following figures :

247,601.

971,345,201.

275.0301.

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3.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

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311,533 83	311,533 83
194,572 32	194,572 32
24,709 46	24,709 46
118,248 30	118,248 30
92,718 50	92,718 50
150,476 14	150,476 14
	103,880 82
	149,004 15
	175,111 81
	193,636 59
	269,803 41
	315,022 36
	205,217 87
	379,558 23
	384,720 19
	445,485 18
	464,546 52
	427,124 98
	337,032 62
	315,783 47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The quartermaster at Leavenworth, Kansas, purchased 75,000 pounds of corn, at $31\frac{1}{2}$ cents per bushel, (56 pounds to the bushel;) 32,113 pounds of oats, at $32\frac{1}{2}$ cents per bushel, (32 pounds to the bushel;) and 79,500 pounds of hay, at $\$22.37\frac{1}{2}$ cents per ton, (2,000 pounds to the ton.) What was the total cost of the purchase?

Give the operation and result in common fractions.

13. An officer of the Treasury Department collected $\$17,850$, and deposited $\$17,493$ in the Treasury, retaining the remainder as his commission. What was the rate per cent. of the commission on the amount collected?

Write the answer in words.

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. The rate of duty on certain wine being one dollar per gallon, and twenty-five per cent. *ad valorem* (or upon the value) and three cents on each bottle, give the total duty on 839 bottles, (each containing one quart,) and costing $\$2.93$ per gallon.

15. What is the amount of pension payable to the widow of a private soldier at $\$8$ per month for herself and $\$2$ per month for each of five children, from the 15th day of August, 1868, to the 21st of June, 1871, including both days, and reckoning thirty days to the month?

16. At what rate per cent., simple interest, must $\$1,560$ be lent to gain $\$426.83\frac{1}{2}$ in 2 years, 8 months, and 25 days, reckoning 360 days to the year?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. If seven $\$100$ United States five-twenty bonds are purchased at the following rates in currency, viz: $111\frac{1}{8}$, 112 , $113\frac{3}{8}$, $112\frac{1}{4}$, $113\frac{1}{4}$, $113\frac{1}{8}$, and $113\frac{7}{8}$, what is the average price paid, and what is the average cost in gold at fifteen per cent. premium?

18. The weight of the United States double-eagle is 1.075 ounces troy. The intrinsic value of a given weight of standard gold is 15.6 times that of an equal weight of standard silver. What is the gold value of an ounce of standard silver?

Give the operation and result in decimal fractions.

7.

ACCOUNTS.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. A collector, on 1st of January, 1871, was indebted to the United States to the amount of $\$927.50$. An advance of $\$420$ was made to him. He paid out on account of employes, $\$628.50$; contingent expenses, $\$42.31$; for his own salary, $\$62.50$; and for commissions, $2\frac{1}{8}$ per cent. on $\$2,400$. State the collector's account with the United States in the frame beneath.

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8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answer to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. What States seceded from the Union in the late civil war?
21. When was Abraham Lincoln assassinated?
22. Who was the first Vice-President of the United States?
23. What are Congressmen at large, and how are they elected?
24. How is the President of the United States chosen?
25. In the following list, state which are rivers and which lakes: Missouri, Pontchartrain, Erie, Ohio, Colorado, and Champlain.
26. Through what rivers, lakes, and gulf do the waters of Lake Superior pass on their way to the Atlantic Ocean?
27. What States borders on the Atlantic Ocean?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question.

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

Now if the revival of the english nashunality had meant the expulshun of the dominant norman race. This would verry probably have bin, the course taken. And the reactshun would have put under a kommon bann langwidge and institooshuns alike, But happily it ment know sutch thing; it ment the blending of the too rases into wun, the forming of a new english nashun, by the gradyoual coalishun of the two by the growing consiousness that this england was the equal heratage of both. The wellfair of which was the kommon interest of both; it was not on either side a tryumph or rather as are awl rekonsiliations it was on both sides a tryumph, but where under these cercumstanses should a suply of the new necesitys be so naturaly look for as from the french.—That was the langwidge of one of the partys in this happy transactshun, of the one which in respect of langwidge was giving up far the most and whitch therefour might farely look for this parshal compensashun.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct such as contain errors in syntax:

Wisdom and not wealth procure esteem.
 I would not act thus if I was him.
 Which is the prettiest of the two?
 A just man will deal justly, and a foolish man will act foolishly.
 Milton is an author who I am much delighted with.
 Neither John or James will send their books.
 It is etiquette not to set down in the presence of royalty.
 The world's government is not left to chance.

11

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply:

1. What is a port of entry?
2. What is a port of delivery?
3. How long can goods remain in bonded warehouse?
4. What is done with them at the expiration of that time?
5. How long a time is generally allowed for a vessel to unlade?
6. What is done with goods remaining on board at the expiration of that time?
7. What additional charge is made on goods remaining more than one year in warehouse?

EXAMINATION No. 27.—PROMOTION.

BUREAU OF STATISTICS, *January 23, 1873.*

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?
2. Residence?
3. Place of birth?
4. Date of birth?
5. State briefly as to your education.
6. What subsequent experience in business or profession?
7. What clerical experience?
8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ARITHMETICAL.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

9. Write in figures the following numbers:

Fifty-three thousand and two.

Twenty-three millions five thousand and twenty-one.

Four hundred millions and six, and decimal one hundred and twenty-three hundred-thousandths.

10. Write at length the numbers expressed by following figures:

247,601.

971.345,201.

275.0301.

1,275,630.10003.

3.

Upon completing the answers to the questions, the candidate should note on the

paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

11. Add the following columns of figures, and give each answer immediately under the column to which it pertains:

\$109,741,134 10
 209,464,215 25
 309,226,814 42
 266,027,537 43
 191,087,589 41
 158,356,460 86
 311,533 83
 194,572 32
 24,709 46
 118,248 30
 92,718 50
 150,476 14

\$109,741,134 10
 209,464,215 25
 309,226,813 42
 266,028,537 43
 191,087,589 41
 158,359,460 86
 311,533 83
 194,572 32
 24,709 46
 118,248 30
 92,718 50
 150,476 14
 103,880 82
 149,004 15
 175,111 81
 193,636 59
 269,803 41
 315,025 36
 205,217 87
 379,558 23
 384,720 19
 445,485 18
 464,547 52
 427,124 98
 337,032 62
 315,783 47

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. The quartermaster at Leavenworth, Kansas, purchased 75,000 pounds of corn, at $31\frac{1}{4}$ cents per bushel, (56 pounds to the bushel;) 32,113 pounds of oats, at $32\frac{1}{2}$ cents per bushel, (32 pounds to the bushel;) and 79,500 pounds of hay, at $\$22.37\frac{1}{2}$ cents per ton, (2,000 pounds to the ton.) What was the total cost of the purchase?

Give the operation and result in common fractions.

13. An officer of the Treasury Department collected $\$17,850$, and deposited $\$17,493$ in the Treasury, retaining the remainder as his commission. What was the rate per cent. of the commission on the amount collected?

Write the answer in words.

5.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

14. The rate of duty on certain wine being one dollar per gallon, and twenty-five per cent. *ad valorem* (or upon the value) and three cents on each bottle, give the total duty on 839 bottles, (each containing one quart,) and costing $\$2.93$ per gallon.

15. What is the amount of pension payable to the widow of a private soldier at $\$8$ per month for herself and $\$2$ per month for each of five children, from the 15th day of August, 1868, to the 21st of June, 1871, including both days, and reckoning thirty days to the month?

16. At what rate per cent., simple interest, must $\$1,560$ be lent to gain $\$426.83\frac{1}{4}$ in 2 years, 8 months, and 25 days, reckoning 360 days to the year?

6.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

17. If seven \$100 United States five-twenty bonds are purchased at the following rates in currency, viz: $111\frac{7}{8}$, 112, $113\frac{3}{8}$, $112\frac{1}{4}$, $113\frac{1}{4}$, $113\frac{1}{8}$, and $113\frac{7}{8}$, what is the average price paid, and what is the average cost in gold at 15 per cent. premium?

18. The weight of the United States double-eagle is 1.075 ounces troy. The intrinsic value of a given weight of standard gold is 15.6 times that of an equal weight of standard silver. What is the gold value of an ounce of standard silver?

Give the operation and result in decimal fractions.

7.

ACCOUNTS.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

19. A collector, on 1st of January, 1871, was indebted to the United States to the amount of \$927.50. An advance of \$420 was made to him. He paid out on account of salaries of employes, \$628.50; contingent expenses, \$42.31; for his own salary, \$62.50; and for commissions, $2\frac{1}{8}$ per cent. on \$2,400. State the collector's account with the United States in the frame beneath.

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8.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

20. What States seceded from the Union in the late civil war?

21. When was Abraham Lincoln assassinated?

22. Who was the first Vice-President of the United States?

23. What are Congressmen at large, and how are they elected?

24. How is the President of the United States chosen?

25. In the following list, state which are rivers and which lakes: Missouri, Pontchartrain, Erie, Ohio, Colorado, and Champlain.

26. Through what rivers, lakes, and gulf do the waters of Lake Superior pass on their way to the Atlantic Ocean?

27. What States border on the Atlantic Ocean?

9.

ORTHOGRAPHY AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it on the examiner's desk.

The answer must be given immediately under the question:

28. Copy the following passage clearly and legibly, correcting mistakes of spelling and punctuation, but not otherwise altering either the words or their order:

Now if the revival of the english nashunality had meant the expulshun of the dominant norman race. This would verry probably have bin, the course taken. And the reactshun would have put under a kommon ban langwidge and institooshuns alike. But happily it ment know sutch thing; it ment the blending of the too rases into wun, the forming of a new english nashun, by the gradyoual coalishun of the two by the growing consiousnes that this england was the equal heratage of both. The wellfair of which was the kommon interest of both; it was not on either side a tryumph or rather as are awl rekonsiliations it was on both sides a tryumph, but where under these cercumstances should a suply of the new necesitys be so naturally look for as frum the french.—That was the langwidge of one of the partys in this happy transactshun, of the one which in respect of langwidge was giving up far the most and whitch therefour might farely look for this parshal compensashun.

10.

SYNTAX.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

29. Copy the following sentences, and correct such as contain errors in syntax.

Wisdom and not wealth procure esteem.

I would not act thus if I was him.

Which is the prettiest of the two?

A just man will deal justly, and a foolish man will act foolishly.

Milton is an author who I am much delighted with.

Neither John or James will send their books.

It is etiquette not to set down in the presence of royalty.

The world's government is not left to chance.

11.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

30. Answer the following inquiries *seriatim*, in the form and style of a letter to the board of examiners, and fold and brief your reply:

1. In what year was the Bureau of Statistics established, and what are some of its principal objects of inquiry?

2. What are some of the leading monthly and quarterly returns, relative to commerce and navigation, received at the Bureau of Statistics?

3. Describe more in detail the character of that portion of them with which you are practically most familiar.

EXAMINATION No. 28.—PROMOTION.

HEAD OF DIVISION,
OFFICE OF INTERNAL REVENUE,
January 31, 1873.

Preliminary.

1.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

1. Name?

2. Residence?

3. Place of birth?

4. Date of birth?

5. State briefly as to your education.

6. What subsequent experience in business or profession?

7 What clerical experience?

8. State in what division of the office you are now employed, and the character of the duties you perform.

2.

ACCOUNTS.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

9. John Doe, an agent for the sale of stamps issued under Schedules B and C, advises the Commissioner that Richard Roe, another agent, has transferred to him the stamps remaining in his hands, amounting to \$1,500, and cash received from the sale of stamps, \$250; and that he (Doe) having decided to discontinue the sale of stamps, incloses a certificate of a deposit in the Treasury of the United States, amounting to \$5,500, together with the balance of stamps remaining in his hands, amounting to \$4,500.

The ledger accounts are "John Doe," "Richard Roe," "Office Stamp Account," "Treasurer of the United States," and "Commission;" what are the journal entries by double entry?

3.

ARITHMETICAL

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

10. Stamps of the value of \$1,500 have been furnished an agent for sale; what amount should he deposit to balance the account?

11. What tax would a brewer pay on the following packages of beer, viz:

146 packages, containing $\frac{1}{8}$ barrel each.

226 packages, containing $\frac{1}{6}$ barrel each.

195 packages, containing 1 hogshead each.

441 packages, containing $\frac{1}{4}$ barrel each.

4.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain. Show the operation at length in each case.

12. What is the present representative value of 99 books of sixty-gallon stamps, each book containing one hundred and fifty stamps, each denoting the tax on sixty gallons of spirits, with nine coupons attached to each stamp, representing the tax on nine gallons of spirits?

13. The internal-revenue tax levied by the United States on leather, in the year 1866, was at the rate of 6 per cent. on the value of the product, and the amount of revenue received on account of this product during the year was \$5,384,812.80. What was the value of the product?

14. What amount of gold must be sold at a premium of $13\frac{1}{2}\%$ in order to purchase \$19,350 coupon United States 6 per cent. bonds of 1881 at $117\frac{1}{2}\%$?

5.

ORTHOGRAPHY, SYNTAX, AND PUNCTUATION.

Upon completing the answer to the question, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answer must be given immediately under the question.

15. Copy the following passage clearly and legibly, correcting mistakes of spelling, syntax, and punctuation:

The duty's of collectors of Internal Revenew is multefareous and incompatable wholley with incompatance but it demands that a consistant and concientious course;

shall at all times be taken, this duty is required first to protect the interest of the government against them who seek to defraud them of their just and legal taxes regularly imposed by law. To arrest all infraction of law or regulation in their insipiancy to prevent any deficiencies in the sum which his deputy's collect and second at the same time to well gauge all acts of his so that a Citizen and Taxpayer may not have been subject to unnecessary hardship and inconvenience so that the Law the arbitrariness may not be rendered odious but the duties of assessors have been in the past important none the less so in fact the assessments have been the basis of collections as formerly not any collections was collectable until after their assessment and the assessor has no legal authority to make revision of taxes assessed or either can he recind from his list names on them.

6.

HISTORY, GOVERNMENT, AND GEOGRAPHY.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

The answers must be given immediately under the questions to which they pertain.

16. Name the Presidents of the United States in their order.
17. Who was the first Secretary of the Treasury?
18. Name the Secretaries of the Treasury since March 4, 1861.
19. Name the Commissioners of Internal Revenue in the order of their appointment.
20. On what principle must direct taxes be apportioned among the several States?
21. Where must bills for raising revenue originate?
22. What is the provision of the Constitution by which authority is conferred on Congress to lay and collect internal taxes?
23. How only can money be drawn from the Treasury?
24. Name the principal mountain ranges, and three of the principal rivers of the United States. Give the general direction which the rivers flow, and name the bodies of water into which they empty.

7.

INTERNAL-REVENUE LAW.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

25. By what act of Congress was the office of Commissioner of Internal Revenue created?
26. By what act of Congress was the position in the office of Internal Revenue, known as Head of Division, created?
27. What are the three principal sources of internal revenue?
28. Give the dates of the approval of the principal acts of Congress now in force relating to tax on these articles?
29. Is there any internal-revenue tax upon articles exported to foreign countries?
30. What is the difference between imposts and excises?
31. Under existing laws, what special or license taxes are assessed, and when does the license year begin?
32. What documentary stamp duties are now in force?
33. What constitutes, in contemplation of law, the use of a documentary stamp?
34. What persons may be appointed agents for the sale of stamps under Schedules B and C?

8.

PRACTICE UNDER THE LAW.

Upon completing the answers to the questions, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

35. How is the capacity of a distillery ascertained?
36. What reports are required of collectors?
37. What reports are required of assessors?
38. What reports are required of internal-revenue gaugers?
39. What reports are required of internal-revenue store-keepers?

40. What returns are required of distillers?
41. What returns are required of brewers?
42. What returns are required of tobacco manufacturers?
43. What credits are allowed the Commissioner in the adjustment of his accounts with stamps issued under Schedules B and C?

9.

LETTER AND BRIEF.

Upon completing the letter, the candidate should note on the paper the exact time he has been engaged upon it, sign it, and place it upon the examiner's desk.

44. Describe the general features of the internal-revenue system, pointing out what, in your opinion, are its merits and defects, in a letter to the Secretary of the Treasury, and fold and brief your letter.

JAMES A. McCULLAH.

M E S S A G E

FROM THE

PRESIDENT OF THE UNITED STATES,

RETURNING

With his objections the bill of the House (H. R. 2852) for the relief of James A. McCullah, late collector of the fifth district of Missouri.

FEBRUARY 11, 1873.—Referred to the Committee of Ways and Means and ordered to be printed.

To the House of Representatives :

I have the honor to return herewith H. R. 2852, entitled "An act for the relief of James A. McCullah, late collector of the fifth district of Missouri," without my approval, for the following reasons: It is provided in section 34 of the act of June 30, 1864, as amended by the act of July 13, 1866, "That it shall be proved to the satisfaction of the Commissioner of Internal Revenue that due diligence was used by the collector, who shall certify the facts to the First Comptroller."

This bill, should it become a law, clearly excuses Mr. McCullah, late collector, from showing that he used due diligence for the collection of the taxes in question while the lists remained in his hands.

U. S. GRANT.

EXECUTIVE MANSION,
February 8, 1873.

LIEUTENANT R. H. PRATT.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The claim of First Lieutenant R. H. Pratt, Tenth Cavalry.

FEBRUARY 11, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT, *February 7, 1873.*

The Secretary of War has the honor to return to the House of Representatives the claim of First Lieutenant R. H. Pratt, Tenth Cavalry, for the value of a horse taken and killed by Comanche Indians in 1869, valued at \$200, (Ex. Doc. 7, 42d Congress, 1st sess.,) inclosed in letter of the Committee on Military Affairs of the 31st ultimo, and to report to the House, for the information of said committee, that Lieutenant Pratt left his station at Fort Sill, Indian Territory, on the 21st October, 1869, on leave of absence; when his leave of absence expired, he was placed on detached duty, and on the 3d of June, 1870, he returned to his station at Fort Sill. He is still a first lieutenant in the Tenth Cavalry.

There is no record of the claim in this Department.

WM. W. BELKNAP,
Secretary of War.

Letter from the Secretary of the Interior, in relation to the claim of Lieutenant R. H. Pratt, United States Army.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., March 13, 1871.

SIR: I have the honor to transmit herewith a copy of a communication, dated the 9th instant, from the Acting Commissioner of Indian Affairs, reporting the claim of Lieutenant R. H. Pratt, United States Army, for the value of a horse taken and killed, by Comanche Indians in 1869, valued at two hundred dollars. The accompanying papers with the report are respectfully submitted to Congress, under the fourth section

of the act making appropriations for the Indian Department, approved July 15, 1870, for such consideration and action as may be deemed proper by that body.

Very respectfully, your obedient servant,

C. DELANO, *Secretary.*

HON. JAMES G. BLAINE,
Speaker of the House of Representatives.

DEPARTMENT OF THE INTERIOR, OFFICE OF INDIAN AFFAIRS,
Washington, D. C., March 9, 1871.

SIR: I have the honor to submit herewith a claim of Lieutenant R. H. Pratt, United States Army, for the value of a horse taken and killed by Comanche Indians in 1869, \$200.

The testimony adduced, in my judgment, sustains the charge. On presentation of the case to the Comanches in council, by the United States agent, Laurie Tatum, in accordance with the requirement of the seventeenth section of the intercourse act of June 30, 1834, respecting claims for depredations by Indians, they admitted killing the horse, but refused to make satisfaction.

I respectfully recommend favorable consideration of the claim, and that it be laid before Congress for the action of that body, under the fourth section of the act making appropriations for the Indian Department, approved July 15, 1870.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

HON. C. DELANO,
Secretary of the Interior.

OFFICE KIOWA AGENCY,
Indian Territory, Twelfthmonth 5, 1870.

FRIEND E. HOAG, SUPERINTENDENT: The accompanying claim of Lieutenant R. H. Pratt for one horse was presented in council to the Indians. The Comanches admit killing the horse, but refused to make satisfaction.

Respectfully,

LAURIE TATUM,
United States Indian Agent.

FORT SILL, INDIAN TERRITORY, *July 27, 1870.*

SIR: I have the honor to submit the following statement and application to the Indian Department:

When I went on leave of absence in October, 1869, I left my horse to be taken care of in the company. I prized him highly, and in fact refused two hundred dollars for him just before going away, because I knew I could not replace him for that sum. I did not return until last month.

The horse was lost from the herd as explained by affidavit of Sergeant Stone, and I am assured that every effort possible was made for his recovery, but with no success.

I do not wonder that the Indians were loath to part with him, as he was by far the best saddle-horse in the six companies of cavalry serving at this post.

All the circumstances attending the loss that can be elicited are given in the papers appended hereto, and you will be able to see where the responsibility for his loss and death lies.

I claim that the Indian Department should re-imburse me to the extent of two hundred dollars for the loss, under the existing treaty between the United States and the Comanches, and request your action to that end.

I have never made any effort to retaliate upon the Indians, or to recover from them for the loss in question.

I have the honor to be, very respectfully, your obedient servant,

R. H. PRATT,
First Lieutenant Tenth Cavalry, Brevet Captain, United States Army.

LAURIE TATUM, Esq.,
United States Indian Agent for Kiowas, Comanches, and Apaches.

Personally appeared before me, Brevet Colonel W. W. Sanders, captain Sixth Infantry, judge-advocate general court-martial, Sergeant Arthur Stone, Company D, Tenth Cavalry, who, being duly sworn, deposes and says:

That on the 12th day of November, 1869, I was in charge of the horses of D company, Tenth Cavalry, while they were out grazing near Fort Sill, Indian Territory; that while they were being watered in Medicine Bluff Creek, the horses of Company C, Tenth Cavalry, were driven into the same place for water, and the two herds coming together created a temporary confusion, during which a large sorrel horse belonging to Brevet Captain R. H. Pratt, first lieutenant of the company, got separated from the herd and lost. After getting the herd quiet again, I looked thoroughly for the horse in the vicinity, but was unable to find him. I reported the loss to the first sergeant of the company about two hours after it occurred, and he sent me two men to help look for the horse, and under my instruction they made diligent and extended search. They reported that they heard from Indians of the horse going up Cache Creek with some Indian ponies, but did not feel justified in going so far away without orders; that the search for the horse was continued for several days, and information that the Comanche Indians in camp ten or twelve miles from Fort Sill up Cache Creek had him, was received. A short time after that I heard that the horse had been killed by the Indians.

ARTHUR STONE.

Sworn to and subscribed before me at Fort Sill, Indian Territory, this 26th day of July, 1870.

W. W. SANDERS,

Bvt. Col., U. S. A., Capt. Sixth U. S. Inf., Judge-Advocate G. C. M.

Personally appeared before me, Brevet Colonel W. W. Sanders, captain Sixth Infantry, judge-advocate general court-martial, Private Henry Johnson, Company D, Tenth United States Cavalry, who, being duly sworn, deposes and says:

That on or about the 14th day of November, 1869, he was sent to look for a large sorrel horse, the property of Brevet Captain R. H. Pratt, first lieutenant Tenth Cavalry, and which had been lost from the herd two days previous; that he got a Comanche Indian who could talk English to go with and assist him in the search; that they went to the Comanche camps up Cache Creek, ten or twelve miles from Fort Sill, Indian Territory, and that on inquiring they found that the horse had been picked up by the Indians in camp there, and was then in their herd about two miles away; that he was informed he could not have the horse without paying something for him, and having no money, he returned to Fort Sill and reported to Lieutenant Doyle, then in command of the company.

his
HENRY + JOHNSON.
mark.

Witness: W. W. SANDERS,

Captain Sixth Infantry, Brevet Colonel.

Sworn to and subscribed before me at Fort Sill, Indian Territory, this 26th day of July, 1870.

W. W. SANDERS,

Brevet Col., U. S. A., Capt. Sixth Infantry, Judge-Advocate, G. C. M.

Personally appeared before me, Brevet Colonel W. W. Sanders, captain Sixth Infantry, judge-advocate general court-martial, Ka-habbe-wath, a Pene-teth-ca Comanche Indian, to me well known, who deposes and says:

That early last winter, having lost some of his horses, he was out looking for them, when, about fifteen miles up Cache Creek from Fort Sill, he discovered a large sorrel horse with a blaze face, which, on being described to him, he believes to have been the sorrel horse owned by Captain R. H. Pratt, first lieutenant Tenth Cavalry, which had been lost while on herd near Fort Sill, Indian Territory, but a short time previous. At the time first seen, the horse was standing up and badly wounded. He went back to camp and reported to Qui-ne-habbe, and the next day he and Qui-ne-habbe went to the place and found the horse dead, and upon examination found it to be an arrow wound, and, looking for tracks near, they found prints of Comanche mocassins, and concluded the horse had been killed by some Indian or Indians of that tribe. Upon further examination we found that a clay-bank colored mare, which we recognized as

belonging to Captain J. W. Walsh, Tenth Cavalry, had also been shot with arrows near by the horse.

KA-HABBE-WATH, his + mark.

Witnesses: O. H. MOORE,
Brevet Lieut.-Col., and Captain Sixth Infantry.
GEO. T. ROBINSON,
Captain Tenth Cavalry.

I have faithfully and truly interpreted the foregoing.

H. P. JONES, *United States Interpreter.*

Sworn to and subscribed before me this 25th day of July, 1870, at Fort Sill, Indian Territory.

W. W. SANDERS,
Brevet Col. U. S. A., Capt. Sixth Infantry, Judge-Advocate G. C. M.

Personally appeared before me, W. W. Sanders, brevet colonel United States Army, captain Sixth Infantry, judge-advocate general court-martial, the undersigned, H. P. Jones, United States Indian interpreter, to me well known, who, being duly sworn, deposes and says:

That he was cognizant of the loss of Captain Pratt's horse in November, 1869; and being requested to make inquiries among the Indians for the horse, he done so, and was informed by Qui-ne-habbe, one of the chiefs of the No-co-nee Comanches, who is since deceased, and Ka-hab-be-wath, a Pene-teth-ca Comanche, that they had found a horse shot with arrows about fifteen miles above Fort Sill, which suited exactly the description of Captain Pratt's horse; that they believed the horse to have been shot by two young Cooch-cho-teth-ca Comanches, who had been in with Wow-way a few days before drawing rations. They were led to this belief by finding the trail of a small mule near, which answered the description of a mule rode by one of the young men.

H. P. JONES, *United States Interpreter.*

Sworn to and subscribed before me at Fort Sill, Indian Territory, this 25th day of July, 1870.

W. W. SANDERS,
Brevet Col. U. S. A., Capt. Sixth Infantry, Judge-Advocate G. C. M.

FORT SILL, INDIAN TERRITORY.

Personally appeared before me, the undersigned, William E. Doyle, second lieutenant Tenth Regiment United States Cavalry, who, being duly sworn, deposes and says:

That on or about the 12th day of November, 1869, a horse, the property of Brevet Captain R. H. Pratt, first lieutenant Tenth United States Cavalry, was taken from its herding-ground, near Fort Sill, by Indians, it being necessary at the time to herd the horses on account of the scarcity of forage. At the time the horse was taken, all the Indians attached to the Kiowa and Comanche agency were at peace with the Government. Captain Pratt was absent from Fort Sill at the time, and I endeavored to find what became of the horse. The Indians informed me that a horse answering the description of Captain Pratt's horse was at the No-co-nee camp, sixteen miles from Fort Sill. I sent a man to look for the horse, and he returned and informed me that the Indians would not let him have the horse. Shortly afterward Qui-ne-habbe, a head-man of the No-co-nee Comanches, told me that the horse was dead; that two young men of the Cooch-cho-teth-ca band of Comanches got that horse and a pony, and as they could not agree upon a division of the horses, they killed them both to prevent ill-feeling, such being the Comanche rule in those cases. Other Indians of the Pene-teth-ca band of Comanches also told me of the horse, and some of them had seen the horse in camp at Fort Sill frequently and knew that it belonged to Captain Pratt. Among the latter was a Pene-teth-ca man, named Pur-ra-habey. From the time that the man came in and told me that the Indians would not let him have the horse until I heard of the horse being killed was about three weeks, I think; and during that time I was carrying on negotiations for the horse with Indians, and had offered quite a large reward for his recovery. During this time, and at the time the horse was taken, I was in command of D company, Tenth Cavalry, of which Brevet Captain R. H. Pratt was first lieutenant.

WM. E. DOYLE,
Second Lieutenant Tenth United States Cavalry.

Witness: J. W. WALSH,
Captain Tenth Cavalry.

FORT SILL, INDIAN TERRITORY.

Sworn and subscribed to before me at Fort Sill, Indian Territory, this 26th day of July, 1870.

W. W. SANDERS,

Captain Sixth Infantry, Brevet Colonel U. S. A., Judge-Advocate.

FORT SILL, INDIAN TERRITORY,
July 26, 1870.

This certifies that I was well acquainted with the qualities of the large sorrel horse belonging to Brevet Captain R. H. Pratt, first lieutenant of my company, which was lost while on herd in November last; that I considered him one of the finest animals at this post, and in my opinion two hundred dollars was beneath his value.

J. H. WALSH,

Captain Tenth Cavalry, Commanding D Company.

FORT SILL, INDIAN TERRITORY,
July 26, 1870.

LIEUTENANT: In answer to your questions I would say that I do remember well your large sorrel horse, taken by Indians at this post last fall. I do not think he could be replaced for a less amount than two hundred dollars; would have been willing to have given you that price for him at any time.

GEO. T. ROBINSON,

Captain Tenth Cavalry.

Brevet Captain R. H. PRATT,

First Lieutenant Tenth Cavalry.

FORT SILL, INDIAN TERRITORY,
July 27, 1870.

At the request of Captain Pratt, Tenth Cavalry, regarding the value of a private horse taken and killed by Indians, at or near this post, I consider him well worth two hundred dollars, and would be willing to pay said price for such a horse.

ROBERT GRAY,

Captain Tenth Cavalry.

H. Ex. 195—2

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CHARLES B. MADDEN.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The claim of Charles B. Madden, late first lieutenant Seventy-ninth Pennsylvania Volunteers.

FEBRUARY 11, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT, *February 7, 1873.*

The Secretary of War has the honor to report to the House of Representatives, for the information of the Committee on Military Affairs, in answer to letter of said committee of the 30th ultimo, requesting information concerning claim of Charles B. Madden, late first lieutenant Seventy-ninth Pennsylvania Volunteers, for traveling allowances, that the claim has never been submitted to this Department.

The records of the Seventy-ninth Pennsylvania Volunteers on file show that he was originally enrolled as an enlisted man, at Lancaster, Pennsylvania, on September 2, 1861, and his resignation as first lieutenant, tendered at Chattanooga, Tennessee, was accepted by Special Orders No. 93, dated August 5, 1864, from Headquarters Department of the Cumberland. It is proper to add that under the regulations of the Department officers discharged on tender of resignation are not entitled to traveling allowances.

The matter of traveling allowances is fully set forth in reports of the Second Comptroller, Adjutant-General, and Paymaster-General; in the supplemental brief for the United States, *The United States, appellants, vs. Jos. W. Price*, Supreme Court United States, 245, December term, 1869.

WM. W. BELKNAP,
Secretary of War.

CHARLES F. SMITH

LETTER

THE SECRETARY OF WAR

TO THE SECRETARY OF THE ARMY
WASHINGTON

DEAR SIR:

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the proposed purchase of the land at the mouth of the River, and in reply to inform you that the same has been referred to the proper authorities for their consideration. I am, Sir, very respectfully,
Yours, very truly,
Wm. W. Blackall

Wm. W. Blackall
Secretary of War

BERNHARD BERNSTEIN.

M E S S A G E

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A letter from the Secretary of State relative to the claim of Bernhard Bernstein.

FEBRUARY 11, 1873.—Referred to the Committee on Foreign Affairs and ordered to be printed.

To the House of Representatives:

In answer to a resolution of the House of Representatives of the 29th of January, requesting information in relation to the case of Bernhard Bernstein, I transmit herewith a report from the Secretary of State upon that subject, with accompanying documents.

U. S. GRANT.

WASHINGTON, *February 8, 1873.*

DEPARTMENT OF STATE,
Washington, February 8, 1873.

The Secretary of State, in answer to a resolution of the House of Representatives of the 29th of January, of which the text is as follows: "*Resolved, That the Secretary of State, if not incompatible with the public service, report to this House all correspondence in his Department with reference to the case and the claim of Bernhard Bernstein, a naturalized citizen of the United States, against Russia,*" has the honor to lay before the President the accompanying copy of papers, a list of which is subjoined, and which are all on record or on file in this Department, upon the subject of the resolution.

Respectfully submitted.

HAMILTON FISH.

The PRESIDENT.

List of papers.

1. Mr. Bernstein to Mr. Seward, October 31, 1864.
2. Mr. Seward to Mr. Clay, November 29, 1864.
3. Mr. Clay to Mr. Seward, December 17, 1864.
4. Mr. Lucas to Mr. Seward, August 16, 1865.

5. Same to same, February 10, 1868.
6. Mr. Seward to Mr. Lucas, February 13, 1868.
7. Mr. Buckley to Mr. Fish, July 19, 1871.
8. Mr. Hunter to Mr. Buckley, July 22, 1871.

No. 1.

Mr. Bernstein to Mr. Seward.

ISBICA, RUSSIA POLEN, *October 31, 1864.*
(Received 18th November.)

SIR: I am a naturalized citizen of the United States of America. In the month of January last I got granted a pass in your honory office, signed by your honor, William H. Seward, and sealed with the great seal of the United States of America. I took my departure from the Empire city, New York, in the month of May. June 22 I came through Berlin, Prussia, got my pass indorsed by his honor H. Kreismann, and also by his excellency Ambassador of Russia, past the lines into Polen in due form, came hereto, this day, my native place of birth, on no other business but to pay a visit to an old father of mine now living, thank God, aged eighty-three years. I staid here all the time without any molestation until Tuesday last, the 25th instant, when I was arrested, on what charge I know not. I was kidnaped, sent under a military escort to Wloclawek; there I was thrown in prison, kept as a common outlaw; but, fortunately, my friends got me out of prison on bail; my pass, together with the charges they brought against me, which charge never was read to me, they sent off to Warsaw, to headquarters. What the orders from there will be I can't tell.

But, as a citizen of the United States of America, I apply to your honor for protection, and, sir, I rely upon you that your honor will attend to it at once. As a citizen of the United States of America I appeal to the Government under which I have lived this last fourteen years, and under which I shelter myself, and which Government I expect to live the remainder of my days, to protect me. God bless the President, his cabinet, and the people at large.

I am, &c.,

BERNHARD BERNSTEIN,
A citizen of the United States of America.

No. 2.

Mr. Seward to Mr. Clay.

No. 104.]

DEPARTMENT OF STATE,
Washington, November 29, 1864.

SIR: I transmit herewith a copy of a letter addressed to this Department by Mr. Bernhard Bernstein, who claims the protection of this Government, and who states that having visited Isbica, Russia, for no other purpose than to see his aged father, he was arrested, and is now confined in that place. You are instructed to ascertain the circumstances attending the arrest and imprisonment of Mr. Bernstein, and if his statement shall prove to be well founded, to do what you properly can toward procuring his release.

I am, &c.,

WILLIAM H. SEWARD.

No. 3.

Mr. Clay to Mr. Seward.

No. 66.]

LEGATION OF THE UNITED STATES,
St. Petersburg, Russia, December 17, 1864.
 (Received January 14, 1865.)

SIR: I am in receipt of your dispatches to No. 104 inclusive, together with the inclosed documents.

In regard to Bernhard Bernstein I had already called the attention of the foreign department to his imprisonment, and asked the necessary explanations.

Poland is yet in an unsettled state, and I recommend all naturalized American citizens, born in that unhappy country, to stay away; as several rebels have used our passports for insurrectionary purposes, and this very naturally brings suspicion upon all persons going there at present.

Your obedient servant,

C. M. CLAY.

No. 4.

Mr. Lucas to Mr. Seward.

NORWICH, CONNECTICUT, *August 16, 1865.*
 (Received August 18.)

DEAR SIR: Inclosed please find passport and a letter from the Hon. C. M. Clay. The object of this communication is to call the attention of the United States Government to the outrage perpetrated on Bernhard Bernstein, that justice may be done, and he compensated for the loss he has sustained. At the time of the breaking out of the rebellion he was a resident of Georgia, and made his escape to the North in 1863, leaving all his property, and came to this city, where he formally resided. In 1864 he thought he would visit his native home, (Isbica, Poland,) and I applied for the passport inclosed for that purpose. He arrived home June 27, 1864, immediately reported to the military authorities, delivered his passport, and informed them that he was there on a visit to his native place, expecting soon to return to the United States. He was told by them to leave his passport, (which he did,) and if he wished to leave the place to visit other parts of Poland to call and get it. This you will notice he did once, by the indorsement of the commander, subsequently crossed (X) and pen drawn through his signature. On the 25th of October, when about to leave for this country, he was arrested, held thirty hours under military guard, and then sent to the county-seat (Wolclawek) under a military escort of three Cossacks, there imprisoned three and a half days, and only released upon the giving of bail by his brother and a rich neighbor of his brother, to the amount of all their property and their lives. His treatment while in prison he represents as indecently severe and shamefully insulting. When released upon the terms above named he applied to our minister at Berlin. He told him to address the Hon. C. M. Clay. He did so November 18, and received no answer; wrote him again in about six weeks and received no reply. On the 6th of March, 1865, he wrote to him again, and the answer to that letter is the one inclosed. Finally, receiving no relief, he went with his friends to Warsaw, and through their influence he was released.

The cause of his arrest was this: It seems he left his home about

eighteen years before, and it was claimed that subsequently he owed the Russian government military service. He assures me that they laughed at him when he reminded them that he was an adopted citizen, and sneeringly asked him when the Russian government gave him permission to become such. You will notice he was *detained in Poland nearly six months*, and, as he was the owner of a large amount of cotton, South, he has consequently suffered great damage.

He applied to me immediately on his return to the United States, but as you were at that time suffering from the murderous attack made on your life, and as the question involved is one of such great importance, I advised him to delay the matter till your health would permit you to give the subject your personal attention. I now respectfully ask that my client be remunerated. It seems to me that our adopted citizens are entitled to *protection*, and I have no doubt that our Government will insist that, when furnished with a passport, they cannot be deprived of their rights and our Government insulted with impunity. An early reply would oblige

Your most obedient servant,

SOLOMON LUCAS.

[Inclosure.]

Mr. Clay to Mr. Bernstein.

LEGATION OF THE UNITED STATES,

Saint Petersburg, Russia, March 15, 1865.

SIR: Your letter of the 2d of March, instant, is received. When your first letter was received I at once called upon Prince Gortchacow, by note, No. 49, November 13-25, ultimo, for an explanation of your case or your speedy liberation, to which note to this day I have received no answer. I will at once write another note urging your liberation.

I am, &c.,

C. M. CLAY.

No. 5.

Mr. Lucas to Mr. Seward.

NORWICH, CONNECTICUT, *February 10, 1868.*

(Received February 12.)

SIR: Will you please inform me of the condition and prospects of the claim of Bernhard Bernstein, a naturalized citizen, about which I have written you several times? You have the papers on file in your Department.

Yours, truly,

SOLOMON LUCAS.

No. 6.

Mr. Seward to Mr. Lucas.

DEPARTMENT OF STATE,

Washington, February 13, 1868.

SIR: Your letter of the 10th instant, relative to the alleged claim of Bernhard Bernstein against Russia, has been received. I have to inform you that no further action has been taken in this case.

I am, &c.,

WILLIAM H. SEWARD.

No. 7.

Mr. Buckley to Mr. Fish.

34 WEST TWENTY-EIGHTH STREET,
New York City, July 19, 1871. (Received July 20.)

DEAR SIR: I have the honor to invite your attention to the inclosed letters of Hon. E. S. Shorter, formerly a member of Congress of second district of Alabama, pertaining to the papers of Bernhard Bernstein, now filed in the Department of State.

Application was made by myself, in person, for Mr. Shorter to withdraw the papers and passport of Mr. Bernstein. This application was made last May. Nothing having been heard from the former application, I beg leave to renew it with a view of settling the claim against the Russian government.

I have, &c.,

C. W. BUCKLEY.

[Inclosure 1 in No. 7.]

Mr. Shorter to Mr. Buckley.

[Extract.]

OFFICE OF SHORTER & BROTHER,
 ATTORNEYS AND COUNSELORS AT LAW,
Eufaula, Alabama, June 3, 1871.

DEAR SIR: Your favor of the 29th ultimo was received this morning, and I note what you say about Mr. Bernstein's claim against the Russian government for illegal arrest and imprisonment. Do try to have his claim taken up and adjusted. I think it likely that, in my former letters, that I stated his claim was against the Prussian instead of the Russian government. Again, I have always written Bernstein's name as "Benjamin Bernstein." He writes his name "Bernhard Bernstein." They call him "Ben" and I supposed his name was Benjamin. Perhaps Bernhard means Benjamin. At any rate, his name is Bernhard Bernstein, and he claims \$60,000 damages for outrages perpetrated upon him by the Russian government, and all his papers are on file in the State Department. It is a good case.

[Inclosure 2 in No. 7.]

Mr. Shorter to Mr. Buckley.

OFFICE OF SHORTER & BROTHER,
 ATTORNEYS AND COUNSELORS AT LAW,
Eufaula, Alabama, July 15, 1871.

DEAR SIR: The pressing necessities of Mr. Bernhard Bernstein is my apology for again writing to you, and inquiring whether any action has yet been taken, or is proposed by the State Department toward indemnifying him for his unlawful punishment by the Russian government. It seems strange after so long delay that the Department will not act either one way or the other. I think the claim for heavy damages is meritorious, and that our Government ought to see that he is righted. If there is no chance to have the State Department consider his case, I will prepare a petition to Congress, and have it presented at next session. The petition will set forth all the facts, and the length of time the matter has been before the State Department, and how it has been treated by the administration. Our passports are entirely useless if the Government fails to protect its citizens abroad while engaged in no unlawful pursuits.

I hope the apparent indifference of the State Department to Mr. Bernstein's case may be explained upon some other hypothesis than that of ignoring the rights of American citizenship in other countries. Please take such steps as will secure some decisive action, either in favor of or against Mr. Bernstein's claims.

Very respectfully, &c.,

ELI S. SHORTER,
Attorney for B. Bernstein.

No. 8.

*Mr. Hunter to Mr. Buckley.*DEPARTMENT OF STATE,
Washington, July 22, 1871.

SIR: Your letter of the 19th instant relative to the case of Bernhard Bernstein, has been received. I have to state that the papers of Mr. Bernstein, having become a part of the records of this Department, cannot, pursuant to a rule of long standing, be withdrawn.

I have, &c.,

W. HUNTER.

PROCEEDS OF PROPERTY PERTAINING TO THE ARMY.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The repeal of section 5 of the act of May 8, 1872, as applies to moneys or proceeds of property pertaining to the Army or under the control of the War Department.

FEBRUARY 11, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT,
Washington, D. C., February 5, 1873.

SIR: I have the honor to transmit herewith a communication recommending that so much of section 5 of an act approved May 8, 1872, as applies to moneys or proceeds of property pertaining to the Army or under the control of the War Department as an executive branch of the service, may be repealed; and I respectfully request that this subject may be brought to the attention of the House of Representatives at an early moment.

Very respectfully, your obedient servant,

WM. W. BELKNAP,
Secretary of War.

The SPEAKER of the House of Representatives.

WAR DEPARTMENT,
Washington, D. C., February 5, 1873.

SIR: I have the honor to recommend that legislation be had to amend section 5 of an act approved May 8, 1872, entitled "An act making appropriations for the legislative, executive, and judicial expenses of the Government, for the year ending June thirtieth, eighteen hundred and seventy-three, and for other purposes."

The first part of the said section directs: "That all proceeds of sales of old material, condemned stores, supplies, or other public property of any kind, shall hereafter be deposited and covered into the Treasury as

miscellaneous receipts, on account of proceeds of Government property, and shall not be withdrawn or applied except in consequence of a subsequent appropriation made by law."

Upon an official communication touching this subject three officers, below mentioned, were asked to report any facts they might "deem worthy of note concerning the operation of the law herein mentioned."

From the replies received extracts are given as follows:

I. In view of the importance of the question raised in connection with these certificates of deposit, as presented in the remarks of Lieutenant Bradley, I have deemed it advisable to return them at once, without waiting for the data upon which to designate the appropriations.

The limited appropriations do not justify the Department in disposing of property without the means of replacing it.

The experience of the past six months * * * has clearly demonstrated the evil results of the law in its application to the Army appropriations, and the consequent embarrassment to this branch of the service. * * * The repeal of the section, which, for reasons already stated, is found to work so disadvantageously to the interests of the service cannot be urged too strongly.—(*Letter of Quartermaster-General Meigs, September 5, 1872.*)

II. It is respectfully submitted that, notwithstanding the amendment by the act of June 8, 1872, the act of May 8, 1872, requiring the proceeds of sales of public property to be covered into the Treasury as miscellaneous receipts, is, in its operation, detrimental to the best interests of the service, embarrassing to this Department and opposed to true economy. * * * The law above referred to does, by its operation, permanently divert a greater or less sum from the appropriation for Army subsistence. As examples of some of the ways in which this diversion is brought about five are mentioned.

Could the money obtained from the sale of the stores be applied to the purchase of fresh stores to replace those sold, the real expenditures of the Government would in nowise be increased, but the apparent expenditures would be lessened.

If the proceeds of these sales continue to go into the Treasury, and be there permanently diverted from the appropriation, it will probably result in a necessity for asking for larger appropriations, or, failing in obtaining such larger appropriations, in having to appeal to Congress for additional appropriations in the form of deficiency bills.—(*Letter of Commissary-General of Subsistence A. B. Eaton, December 27, 1872.*)

III. The act of May 8, 1872, even with the modification of June 8, 1872, is objectionable and embarrasses the public service, and, in my judgment, should be repealed by an act authorizing the procurement of new supplies with the proceeds of sales. Under such a law the emigrants and settlers on the frontiers could be supplied, as formerly, with good arms and ammunition for their protection against Indians.—(*Letter of Major S. V. Benét, by order of the Chief of Ordnance, January 9, 1873.*)

These extracts exhibit several of many reasons why said law does not operate satisfactorily. These several are deemed sufficient for me to respectfully recommend to Congress, as I do now, that so much of the said law as applies to moneys or proceeds of sales of property pertaining to the Army or under the control of the War Department may be repealed.

Very respectfully, your obedient servant,

WM. W. BELKNAP,
Secretary of War.

Hon. JAS. G. BLAINE,

Speaker of the House of Representatives Forty-Second Congress.

MIAMI INDIANS, AND THE RIGHTS OF SETTLERS ON THEIR
LANDS.

LETTER

FROM THE

SECRETARY OF THE INTERIOR,

RELATIVE TO

*The condition of the Miami Indians, and the rights of certain settlers upon
the lands of said Indians.*

FEBRUARY 11, 1873.—Referred to the Committee on Indian Affairs and ordered to be
printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., February 8, 1873.

SIR: I have the honor to transmit herewith a copy of a communication from Enoch Hoag, superintendent of Indian affairs for the central superintendency, dated Lawrence, Kansas, December 7, 1872, in regard to the condition of the Miami Indians, and the rights of certain settlers upon the lands of those Indians, and the necessity of some legislation for the purpose of protecting the interests of the Indians, and, at the same time, do justice to the settlers.

The subject requires the immediate attention of Congress, for, without legislative action, it is impossible to remove the difficulties and embarrassments that now exist or to do justice to the Indians and settlers. I invite special attention to the conclusions at which the superintendent arrives, viz, that the Miami Indians be settled at once in the Indian Territory, confederated, according to the desires of both tribes, with the Peorias; that the money due them, under former treaties, be paid, and that they be reimbursed for lands fraudulently taken by the act of 1858, to which reference is made in his letter.

Concurring in the general views of the superintendent, and in his recommendation for a final settlement of these difficulties, I beg to express the earnest desire that this subject may receive the immediate attention of the House of Representatives, through its Committee on Indian Affairs, to which committee, if it be proper, I beg to suggest that this letter, with Mr. Hoag's communication, be referred.

Very respectfully, your obedient servant,

C. DELANO,
Secretary.

The Hon. SPEAKER of the House of Representatives.

OFFICE OF INDIAN AFFAIRS,
CENTRAL SUPERINTENDENCY,
Lawrence, Kansas, Twelfthmonth 7th, 1872.

Hon. C. DELANO,

Secretary of the Interior, Washington, District of Columbia :

Referring to a letter from this office to the honorable Commissioner, of Secondmonth 10th last, submitting report of negotiations, under instructions from the Department for the transfer of lands of certain Miami Indians to settlers thereon for a consideration mutually agreed upon by the parties in interest, (see Department letter August 5, 1871, and papers connected therewith, to which I call especial attention,) and also referring to personal interview between the honorable Secretary and myself on the 10th of October last on the cars *en route* to Washington, I desire to say, this office has labored long, earnestly, and impartially for the interests of this people, and, as will be observed by reference to letter of Fifthmonth 5th, 1871, succeeded in obtaining a proposition from the Indians acceptable to the settlers, by which the former might receive from the latter an approximate value for their lands. This proposition was indorsed, with certain modifications, and returned by Acting Commissioner Clum, with instructions, under direction of the honorable Secretary of the Interior, to complete the negotiations (see Department letter above referred to) subject to ratification by Congress. In accordance with said instructions, this office labored in good faith, and perfected arrangements with a majority of the settlers; and could the congressional aid, referred to in Commissioner's letter, have been realized to confirm the negotiations, and in accordance with recommendations from this office could they have been allowed, in accordance with the oft-expressed desires of both the tribes in interest, to remove to and become incorporated with the Peorias, Weas, &c., this perplexing question would have ceased to trouble the Department, and the Indians referred to would have been comfortably settled in the Indian Territory.

These people, having their all at stake, dependent solely upon the legislation of Congress, knowing full well that designing men were at work, in and out of Washington, to secure their few remaining lands, for a mere moiety, to rob them of the greater portion of their annuities, naturally desired to be heard in the premises, and asked and asked permission to visit Washington for that purpose about one year ago.

In reply, this office was requested to inform them "that it is not deemed necessary at this time to visit this city, (Washington,) and that their interests will be attended to by this office," (see Commissioner's letter January 15, 1872.) Apprehending that advantage would be taken of their absence by the parties referred to, to misrepresent them, they repeated the request all the time, urging, as an ultimate object, their consolidation with the Peorias. This office, in view of the importance of their affairs pending before Congress, indorsed there quest, (see letter Secondmonth 3, 1872.)

By Commissioner's letter in answer thereto, "February 4," it will be seen they are again promised "their interests will be attended to by this office," and they are again refused permission to visit Washington. Now for the first time the honorable Commissioner informs this office that if they desire to join the Peorias at all they must do so as individuals, after having been citizenized against their will, and, but for their persistency, without their knowledge. And this because the twenty-sixth article of the omnibus treaty of 1867 limits the time for their consoli-

dation to two years, while it was always understood by them and by this office that congressional aid must be had to enable them to dispose of their property and effect said consolidation, and for this very reason, with others, they asked to be represented in Washington.

The necessity of first passing a bill to citizenize these Indians against their will, to force them (if they join at all) to join the Peorias as individuals, losing their identity as Miamies, is hardly apparent. But they are informed that a "bill is already before Congress, which meets the approval of the Department," and this bill dissolves their relations as Miamies.

The Miami chiefs hardly recognize this approval of the Department as attending to their interest as promised.

It may be assumed that they, as ignorant Indians, are not cognizant of their own wants, and that their interests might be faithfully attended to, even in opposition to their wishes; but if they have not the capacity to judge for themselves, it would seem hardly consistent, in such a condition, to force upon them citizenship.

Again, it will be observed, that the mutual arrangements between themselves and the settlers heretofore referred to, provide for the payment of the original appraisement value of their lands in 1860, and 7½ per cent. per annum added to date of sale, or from 80 to 90 per cent. advance instead of twenty per cent. as provided in the bill (Shanks's bill) before Congress, which they are informed has the approval of the Department, and through which they expected the promised Department aid.

It may reasonably be asked by what moral or even legal right is it presumed to legislate for these Indians, involving in such legislation the vested rights of the tribe, without their knowledge or consent?

I can find no such authority, except it be contained in the eleventh article of the treaty of 1854, and a careful reading of said article convinces me clearly that Congress can only make such provisions by law, as experience shall prove to be necessary, to advance the interests of said Indians, and surely it will not be claimed by the advocates of the bill in question, which reduces the price to be paid for their lands to two-thirds the amount actually agreed upon between themselves and the purchasers, and upon which contract a cash payment has already been made, that such a law is necessary to advance the interests of the tribe.

The question naturally arises, in the perusal of the bill, who constitute the Miami tribe of Indians and to whom do their lands in Kansas belong? I find in the last clause of the sixth article of the treaty of 1838 the following words, to wit:

Nor shall any person or persons other than the members of said tribe, who may, by sufferance, live on the land of, or intermarry in said tribe, have any right to the land, or any interest in the annuities of said tribe, until such person or persons shall have been by general council adopted into their tribe.

By article 10 of the same treaty, the United States stipulated "to possess the Miami tribe of Indians of, and guarantee to them forever, a country west of the Mississippi River, to remove to and settle," &c., (not to remain in Indiana and receive their proportionate share,) "and when the said tribe shall have emigrated, the United States shall protect the said tribe," &c., &c.

By the treaty of 1840, which appears to have been finally adopted, with amendments, May 15, 1841, the location and boundaries of the lands set apart for the Miami tribe, west of the Mississippi, were defined, and it was therein stipulated that they should remove thereto within five years. The tract of land thus set apart for their occupancy was estimated to contain five hundred thousand acres.

It also appears from the treaties referred to, that the consideration for the lands ceded to the United States, by virtue of said treaties, was stipulated to be paid to said tribe in money, and in no case was the tract of land set apart for their future homes referred to as even part consideration for the land ceded to the Government east of the Mississippi.

On the contrary, it appears to have been promised them wholly in consideration of occupancy, in the language of the treaty, "to remove to and settle on." I apprehend it will not be claimed by the advocates of the bill, that any portion of the so-called Miami lands of Kansas would be recognized as the property of the tribe if they had not removed to and settled upon them. This was the only condition imposed upon them as the price of the inheritance; the Miamies of Kansas paid the price, and in equity, at least, are entitled to the proceeds of the same.

By the treaty of 1854, it is observed that certain chiefs, "Big Legs" and others, residing in Kansas, and representing the Miami Indians of Kansas, were recognized by the Government as delegates representing the Miami tribe of Indians, and treated with as such, while the five Indians, resident of the State of Indiana, were not so recognized in the preamble, but were required by the Senate amendment to article 4 to "take the opinion of their people, on their return home, and advise the Department without delay;" and appended to the Senate amendments appears the following article, to wit:

The Miami Indians, of Indiana, being now represented in Washington by a fully authorized deputation, and having requested the foregoing amendments, the same are binding on them, &c.

Now the treaty-making power of the Government did recognize a delegation of Indiana Miamies as fully competent to negotiate with the Government, and with the Western Miamies in all matters involving a common tribal interest, and by that treaty the common funds of the tribe were divided, in a manner satisfactory to both Eastern and Western Miamis; a portion of their reserve in Kansas was ceded to the United States, but no portion of the proceeds was even claimed by the Indiana Miamies, for the very good reason they had no interest in it, and if any evidence is wanted to confirm this view of the case, the treaty itself seems to furnish just that kind of evidence. The second article thereof states that each individual, or head of family, of the Miami tribe, "now residing on said lands," (surely not those residing in Indiana, who never saw them,) "shall select, if a single person, two hundred acres, and if the head of a family, a quantity equal to two hundred acres for each member of the family," &c., "and if, by reason of absence, or otherwise, any single person or head of family, entitled to land, as aforesaid, shall fail to make his or her selection within the period prescribed, the chiefs of the tribe shall proceed to select the lands for those in default." Further on, in the same article, appears the following language, to wit:

Provided, That if any single person, or head of family entitled to land, shall have been overlooked or wrongfully excluded, and shall make the fact appear to the satisfaction of the chiefs, such person or family may, with the approbation of the Commissioner of Indian Affairs, receive their quantity, &c.

Now to whom do these provisions apply? Can they, by any language used in said article or treaty, be made to apply to others than those for whom the article was expressly inserted? The provision bears its own unmistakable evidence: "those now residing on said lands," "who by absence or otherwise have failed to make their selections," or, "who have been overlooked or wrongfully excluded;" and in either case a specific remedy is therein provided, through the chiefs in both cases, but requiring the approbation of the Commissioner of Indian Affairs in the

latter. But the proposed bill at this time seeks to incorporate into the tribe, before dissolving its tribal organization, for the apparent purpose, and no other, of receiving a share of the funds to be divided at its dissolution, a class of people claiming some Miami blood, but who to this day have never been recognized as Miamies, either by the tribe in Kansas or by those residing in Indiana, who, it is certain, have never joined the tribe in Kansas, and until now have claimed no benefits from their annuities. They are residents of Indiana, and for whom if they ever had any rights, (which is by no means admitted by the chiefs and council,) the treaty of 1854 made provision, (second article, and also Senate amendments,) "the Miami Indians of Indiana being now represented in Washington, by a fully authorized deputation," &c. If the Senate was imposed upon at the time of making the treaty, it was in consequence of the failure of the "fully authorized deputation" from Indiana to report their numbers.

The tribe in Kansas acted in good faith, and cannot in any moral or legal sense be made to suffer, by a failure of the treaty to provide for all of the Indiana Miamies. Ordinarily the chiefs of a tribe are presumed to know who are entitled to tribal membership and who are not, and their decisions in council are regarded as final and conclusive; hence the reference of this matter to them by the second article was very properly made, and in this case seems to me especially binding on account of its reference as aforesaid.

But the advocates of the present bill claim another provision of the same treaty of 1854, applicable to this case, and from which they claim authority to entail these residents of Indiana upon the Miami tribe in Kansas by legislation, and without the consent of the tribe, to wit:

ART. 11. The object of this instrument being to advance the interests of said Indians, it is agreed, if it prove insufficient, from causes which cannot now be foreseen, to effect these ends, that the President may, by and with the advice and consent of the Senate, adopt such policy in the management of their affairs as, in his judgment, may be most beneficial to them, or Congress may hereafter make such provision by law as experience shall prove to be necessary.

Now it seems clearly to have been the intent of this article to confer upon Congress the power to legislate upon such matters only as were not reached by the treaty itself from causes unforeseen, and then only in their interest and to their advantage; from the wording of the article it cannot be so construed as to confer any power to legislate detrimentally to their interests.

Inasmuch as the provisions of this article are general and not specific in their character, and only intended to reach cases unforeseen and unprovided for, it must be apparent that they cannot apply to the case of the residents of Indiana, seeking through counsel to be incorporated into the tribe, who, even if they had rights, must have been overlooked, in which case they would have a specific remedy in article 2, already referred to. If not overlooked they must have been considered in the adoption of the Senate amendment to the treaty, wherein it limits the number to receive annuities, &c., with those residing in Indiana, to the corrected list of three hundred and two persons, in which case the next claim of the amendments made a full exemption from the burden, so far as the Miamies west of the Mississippi were and are concerned, in the following words: "But these amendments are in no way to affect or impair the stipulations in said treaty contained as to the Miamies west of the Mississippi," &c. Again, it can hardly be considered "to advance the interests of said Indians," to provide by law for the incorporation into their tribe, against their consent and contrary to the long-established usage of the Government toward Indian tribes, aliens

and strangers numerically sufficient to absorb at least one-half their resources.

As heretofore stated, by the treaty of 1854, at the conclusion of which, in the language of the Senate amendment, "the Miami Indians of Indiana being now represented in Washington by a fully authorized deputation," &c., all the funds of the tribe were divided, and the equitable portion of those residing in Indiana was set apart for them; so with the tribe in Kansas; but no claim was advanced by the former for any portion of the proceeds of the sale of the surplus lands in Kansas, that property being conceded by the Indiana Miamies and by the Government as belonging exclusively to the tribe in Kansas. The provisions of this treaty are clear, and appear to have been understood by all the parties thereto; but it must be remarked that while the "fully authorized deputation" from Indiana was present, and requested the Senate amendments to the same, the delegates from the tribe in Kansas were not present at the adoption of said amendments, and were not consulted herein. The following language appears in the same, to wit:

But these amendments are in no way to affect or impair the stipulations in said treaty contained as to the Miamies west of the Mississippi.

It is a noticeable fact that while the treaty itself provided for the equitable division of the funds of the tribe between the Indiana and Western Miamies, the amendments (at the adoption of which the former were present, and not the latter) contained a provision that—

No persons other than those embraced in the corrected list agreed upon by the Miamies of Indiana, in the presence of the Commissioner of Indian Affairs, in June, 1854, comprising three hundred and two names as Miami Indians of Indiana, and the increase of the families of the persons embraced in said corrected list, shall be recipients of the payments, annuities, commutation moneys, and interest hereby stipulated to be paid to the Miami Indians of Indiana, unless other persons shall be added to said list by the consent of the said Miami Indians of Indiana, obtained in council according to the custom of the Miami tribe of Indians.

Now, if this proviso means anything, it evidently means to establish the fact that the three hundred and two persons contained in the corrected list referred to were all that were left east of the Mississippi entitled to receive any of the annuities or claim any of the benefits of tribal relationship with the Miami tribe of Indians. It undoubtedly intended to settle the question of all other claimants then and thereafter, and in that settlement it pronounced them bogus.

Without this proviso no one, I apprehend, could be found even making the attempt to fasten these residents of Indiana upon the tribe in Kansas; for surely, if they belonged with the Miamies anywhere, there could have been no dispute as to which branch they naturally belonged, and hence the delegates from Indiana requested the amendment; and the Senate, aware of the illegality of adopting the same in the absence of the Kansas Miamies, appended thereto the following, to wit:

But these amendments are in no way to affect or impair the stipulations in said treaty contained as to the Miamies west of the Mississippi, &c.

The act of Congress of June 12, 1858, is offered as a precedent upon which it is proposed to pass the present bill.

This act appears to have been found as an attachment to a general supplemental appropriation bill for the Indian Department for that year, and provided that such persons of Miami blood as had been excluded from the annuities of the tribe since their removal, &c., should receive their proportion of annuities and be entered upon the pay-roll, &c. It also provides lands for each of said persons out of the common reserve in Kansas, &c., which, in the language of the treaty heretofore referred

to, was given to the Miami tribe "to remove to and settle on." (See treaty 1838.)

From the provisions hereinbefore set forth, it seems clear to me that the act of 1858 was in direct violation of the treaties of 1838, 1840, and 1854, and hence entitled to no force as a precedent. It was passed without the knowledge or consent of the tribe, and only submitted to because they had not the power to resist it. It was passed in the interest of speculators in these lands, who have made enough from the proceeds to support them to the present day, and who now appear before the Department and Congress to obtain a further share in the distribution of the remaining assets of the tribe.

Examine the records of the counties in which said lands are located, and the large share of this valuable domain wrongfully and fraudulently taken from the Miami tribe, shown to have passed through and still remaining in the hands of these self-constituted agents and lobbyists of said bogus Miamies, residents of Indiana, and the secret of their extreme interest in the passage of this bill will be revealed.

Another feature of the proposed bill, equally fatal to the interest of the Miami tribe, is contained in the following extract, to wit:

Provided, That no portion of said consolidated fund shall be paid to any members of said tribe, or person of Miami blood or descent, who has drawn annuities or money, or received allotments of land, from any other tribe or tribes of Indians, at any time since the removal of the Miami tribe of Indians to Kansas.

Now, it is well understood by this office and the Indian Bureau that an agreement was made between the Miami Indians and the Peorias, by which the two tribes were to be consolidated, under the name of Confederated Peorias and Miamies; that said tribes have knocked at the door of Congress for years, begging for a ratification of this agreement; that the Miamies were impelled to this course in part by their natural attachment to the Peorias, and of necessity because of the settlement of their lands in Kansas by white people, in violation of treaty, and from whose encroachments the Government afforded them no protection.

In anticipation of the early ratification of this agreement by Congress, a portion of said tribe did actually go to the Peorias, not supposing that by so doing (with the full knowledge of this office and the Indian Bureau) they were in any danger of losing their own rights in their own tribe, even though through the kindness of the Peorias they may have been allowed to draw annuities in advance of the proposed consolidation.

But the interest of these self-constituted lobbyists and agents of the bogus Miamies is perceptible in this as well as other provisions of the proposed bill. The more real Miamies they can exclude from participation in the assets of the tribe, and the more bogus Miamies they can include, the greater of course is their share of the spoils. They have secured the assistance of the former chief of said tribe to work in their interests, and he, of course, is provided means to visit Washington to aid in procuring the passage of the bill, and he is bitter in his complaints at the sum taken from the tribal funds by an almost unanimous vote of the tribe to pay the expenses of the delegates visiting Washington last winter to look after the interests of their people, and but for whom, undoubtedly, the obnoxious bill in question would have become a law.

The Miami matters still being in the hands of the conference committee, as the agent of the lobbyists, and former chief referred to, were preparing again to go to Washington, at the opening of Congress, the present chiefs, uneasy at the probable result of their affairs, still pend-

ing, without a representation, on behalf of the tribe, appealed to this office for permission for a duly authorized delegation of the tribe to visit Washington during the present session of Congress. This office indorsed said request, and transmitted the same to the honorable Commissioner, on the 9th ultimo, for approval. The honorable Commissioner replied, under date of November 26, "that it is not deemed necessary that a delegation of said Indians should visit this city (Washington) for the purpose indicated," &c. If it is not deemed necessary that a delegation should visit Washington for the purpose indicated, their interests should be attended to, and to insure attention some person or persons should be authorized to represent them fully cognizant of all the facts.

They are deeply interested in the legislation of the present Congress. Justice demands that their rights and their interests be protected; their treaties demand it; the present humane policy of the Government toward the Indians demands it, and I would be derelict in my duty toward the tribe if I did not, in their behalf, ask it. Expediency requires it. One of the most effectual means that I have found of reaching the wild tribes of the plains is through the semi-civilized. Deal justly with the latter at all times, acknowledge their rights, and cheerfully grant them, take no advantage by unfriendly legislation, recognize no professional leeches or designing white men as their agents, and through them the Government can always rely for aid in managing the former. In a word, rid the central superintendency of the class of men referred to, and the agents and superintendent, with the encouragement of the Department, can have a reasonable assurance of successful management of the Indians. To this end I recommend (and earnestly ask the aid of the honorable Secretary) to settle the Miami Indians at once in the Indian Territory, confederated, according to the desires of both tribes, with the Peorias. Give them the money due them from former treaties and the sale of their lands, and, if need be, reimburse them for lands fraudulently taken by the act of 1858, before alluded to. This will enable them to join the Peorias on terms of equality, and the vexed question of the Miamies will be effectually and justly settled; and the confederated tribe will be able to render valuable aid in the civilization of their wild brethren of the plains.

All of which is respectfully submitted.

Very respectfully,

ENOCH HOAG,
Superintendent Indian Affairs.

PURCHASE OF GATLING GUNS.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

An appropriation for the purchase of a limited number of Gatling guns for the use of the Army.

FEBRUARY 11, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

WAR DEPARTMENT, *February 5, 1873.*

The Secretary of War has the honor to report to the House of Representatives, in answer to a letter of the Committee on Appropriations of the 25th ultimo requesting the views of the Department on the propriety of an appropriation for the purchase of a limited number of Gatling guns for the use of the Army, by transmitting to the House, for the information of said committee, copies of the reports of the Chief of Ordnance and of the board of engineers for fortifications, and to state that he concurs in the views expressed in these reports.

The letter of the Gatling Gun Company of the 24th ultimo is herewith returned.

WM. W. BELKNAP,
Secretary of War.

ORDNANCE OFFICE, *January 28, 1873.*

Respectfully returned to the Secretary of War.

Most, if not all, of the great powers of Europe have adopted some description of mitrailleuse, and the Gatling gun has met with great favor, and has been largely introduced into European service as a necessary auxiliary to the other arms of the service. The last model projected by the inventor for use with cavalry, to be transported on pack-animals, so as to accompany troops in rapid marches and in mountain districts,

seems to be most desirable for our frontier service, and it is respectfully recommended that an appropriation for the purchase of fifty of these guns be asked of Congress.

By order of the Chief of Ordnance.

S. V. BENÉT,
Major of Ordnance.

OFFICE OF BOARD OF ENGINEERS FOR FORTIFICATIONS,
ARMY BUILDING, CORNER HOUSTON AND GREENE STS.,
New York City, February 1, 1873.

GENERAL: The board of engineers for fortifications has considered the question of the introduction of a limited number of Gatling guns into our service, as referred to it by your indorsement of 30th January, 1873, upon the communication of the Committee on Appropriations of the House of Representatives to the Secretary of War, inclosing a letter of John Love, acting president of the Gatling Gun Company, asking for an appropriation for that purpose; and has now the honor to submit the following report thereon:

The Gatling gun has never been presented to this board for examination or opinion; but from our individual knowledge and from published accounts of experiments in Europe, we are inclined to believe that it has no superior—probably no equal—as a “mitrailleuse.” It could doubtless be advantageously used in our fortifications for flanking purposes and for land defense; possibly, too, for service against ships of war venturing too close with our sea-coast batteries, for throwing missiles into port-holes, or for picking off exposed men. For frontier defenses, such as block-houses, stockades, and field-fortifications for defense against an enemy without artillery, they would doubtless serve a very important part.

We do not feel prepared to recommend the purchase of any particular number of these guns, but presume that we fulfill the object of the reference to us in stating our opinion of the value of the weapon.

The papers connected with the subject are herewith returned.

Respectfully submitted.

J. G. BARNARD,
Colonel of Engineers and Brevet Major-General.
GEO. W. CULLOM,
Colonel of Engineers and Brevet Major-General.
Z. B. TOWER,
Lieutenant-Colonel of Engineers, Brevet Major-General.
H. G. WRIGHT,
Lieutenant-Colonel of Engineers, Brevet Major-General.

Official copy:

THOS. LINCOLN CASEY,
Major of Engineers.

Brigadier-General A. A. HUMPHREYS,
Chief of Engineers U. S. A., Washington, D. C.

WASHINGTON, D. C., *January 24, 1873.*

SIR: The Gatling Gun Company would respectfully petition your honorable committee to make an appropriation for supplying a limited number of Gatling guns for Army service.

The gun has been examined by military committees at home and abroad, and without exception its merits have been conceded. It is unnecessary to consume the time of your honorable committee with any argument at length, preferring to rest the claims of the gun on reports of commissions from our Army and Navy.

We would say, however, that since the reports from the commissions referred to, we have perfected a model which, firing as many shots per minute (400) as the larger guns, weighs about 125 pounds only.

This model we believe valuable for service on the plains, where a gun, easily transported on the back of a horse or mule, could accompany cavalry.

Although our Government purchased some Gatling guns under an order from the then Secretary, Mr. Stanton, yet the improvements in the details of construction have been so marked as to make the gun of to-day practically a new arm.

Our gun has now been adopted by most of the leading powers of Europe, England, Russia, Turkey, and is now being examined by the government of France.

This gun being so entirely different from all arms heretofore in use, it would seem important that it be placed at the earliest day in the hands of the soldier, that he may become expert in its manipulation. To illustrate: The sewing-machine is valueless in the hands of inexperienced operators; the art of manipulating it once acquired, its value is incalculable.

In this view we would seem to be sustained by the experience of the French with their "mitrailleuse."

Instead of putting it in the hands of troops for drill, it was carried to the front as a great mystery, and was consequently valueless until later in the war, when with more experience in its manipulation and use it proved at Gravelotte and Sedan an arm of most destructive power.

The larger calibers of Gatling guns we believe invaluable for defensive works and positions.

With the hope that our petition may meet with favorable consideration, we have the honor to be, with the highest respect, your obedient servants,

The GATLING GUN COMPANY.

By JOHN LOVE,

Vice and Acting President.

Hon. JAMES A. GARFIELD,

Chairman Committee on Appropriations.

The first of these is the fact that the United States is a young nation, and that its history is a history of growth and development. It is a history of a people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The second of these is the fact that the United States is a nation of immigrants. It is a nation of people who have come from many different parts of the world, and who have brought with them their own customs and traditions. This has made the United States a very diverse and interesting nation.

The third of these is the fact that the United States is a nation of pioneers. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The fourth of these is the fact that the United States is a nation of freedom. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The fifth of these is the fact that the United States is a nation of progress. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The sixth of these is the fact that the United States is a nation of peace. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The seventh of these is the fact that the United States is a nation of justice. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The eighth of these is the fact that the United States is a nation of hope. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The ninth of these is the fact that the United States is a nation of love. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The tenth of these is the fact that the United States is a nation of faith. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

The eleventh of these is the fact that the United States is a nation of courage. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony. It is a nation of people who have been able to overcome many difficulties and to build a great nation out of a small colony.

MODOC INDIANS.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

RELATIVE TO

The present difficulties with the Modoc Indians.

FEBRUARY 11, 1873.—Referred to the Committee on Indian Affairs and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., February 8, 1873.

SIR: For the information of the House of Representatives, I have the honor to transmit herewith a copy of a report, dated the 7th instant, from the Acting Commissioner of Indian Affairs, together with Senate Ex. Doc. No. 29, Forty-second Congress, third session, in answer to a resolution of the House, dated the 3d instant, in the following words, viz:

Resolved, That the Secretary of the Interior be, and he is hereby, instructed to inform the House, at his earliest convenience, of the cause of the present difficulties with the Modoc Indians.

I will remark that, as stated in the communication to the Senate on the 16th ultimo, in reply to a similar resolution of that body, there are on file in the Indian Office other papers, bearing upon this subject, that are voluminous; and it has not been deemed advisable to delay an answer to the resolution for the purpose of copying them, as their substantial import is exhibited in those now forwarded.

Very respectfully, your obedient servant,

C. DELANO,
Secretary.

Hon. JAMES G. BLAINE,
Speaker of the House of Representatives.

DEPARTMENT OF THE INTERIOR, OFFICE OF INDIAN AFFAIRS,
Washington, D. C., February 7, 1873.

SIR: I have the honor to be in receipt, by reference from the Department, of a resolution adopted by the House of Representatives on the 3d instant, the same being in terms as follows:

Resolved, That the Secretary of the Interior be, and he is hereby, instructed to inform the House, at his earliest convenience, of the cause of the present difficulties with the Modoc Indians.

In compliance with your instructions to submit a report upon the subject-matter of this resolution, I have the honor to state, briefly, that the existing difficulties with the Modoc Indians, in Oregon, arise from the armed resistance of certain members of the tribe, under the leadership of Captain Jack, to an effort on the part of the Government to locate them on the reservation assigned for their use by the treaty concluded with them on the 14th of October, 1864, (16 Statutes at Large, p. 707.) Though a portion of the tribe, under their head chief, have remained quietly on this reservation, Captain Jack and his band, which comprises the more turbulent and lawless of the Indians, have, with the exception of a few months in 1869 and 1870, never complied with their treaty stipulations, but have persisted in living at their old home near Clear Lake, about sixty miles southeast of Klamath, where, by their petty depredations, they have been the source of continual annoyance to the settlers in the vicinity. The superintendent of Indian Affairs for Oregon reports the present attitude of defiant hostility, which these Indians now maintain toward the Government, to be, in great measure, due to the advice and influence of evil-disposed persons living at, or near, Yreka, California.

The foregoing statement contains all the information, in the possession of this Office, which bears upon the specific inquiry of the House resolution. For further information regarding these troubles, I would refer you to my report of the 14th ultimo, with papers accompanying, which appears as Senate Executive Document No. 29 of the present session of Congress, a copy of which is herewith inclosed.

The resolution of the House of Representatives is herewith returned. I have the honor to be, very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

The Hon. the SECRETARY OF THE INTERIOR.

Letter from the Acting Secretary of the Interior accompanying information called for by the Senate resolution of January 8, 1873, relative to the Modoc and other Indian tribes in Northern California.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., January 16, 1873.

SIR: For the information of the Senate I have the honor to transmit herewith a copy of a report, dated the 14th instant, from the Acting Commissioner of Indian Affairs, and accompanying papers, in answer to a resolution of the Senate, dated the 8th instant, in the following words, viz:

"Resolved, That the Secretary of the Interior be directed to furnish the Senate such information as may be in his Department touching existing difficulties with the Modoc and other Indian tribes in Northern California and Southern Oregon."

It appears from the report of the Acting Commissioner that there are on file in the Indian-Office other papers, bearing upon this subject, that are voluminous; and as their substantial import is exhibited in those now presented, it has not been deemed advisable to delay an answer to the resolution for the purpose of copying them. Such copies will, however, be furnished if desired.

Very respectfully, your obedient servant,

B. R. COWEN,
Acting Secretary.

The PRESIDENT OF THE SENATE.

DEPARTMENT OF THE INTERIOR, OFFICE OF INDIAN AFFAIRS,
Washington, D. C., January 14, 1873.

SIR: I have the honor to be in receipt, by reference from the Department, of Senate resolution of the 8th instant, the same being in terms as follows:

"Resolved, That the Secretary of the Interior be directed to furnish the Senate such information as may be in his Department touching existing difficulties with the Modoc and other Indian tribes in Northern California and Southern Oregon."

In compliance with your instructions to submit a report upon the subject-matter of this resolution, I have the honor to state that no serious difficulties are known to exist with any tribes in the sections named other than with the Modocs.

This tribe has been known to this office since 1853 as generally unfriendly to the whites. It first entered into formal relations with the Government by a treaty to which the Klamaths and Yahooskin band of Snakes were also parties, (16 Statutes at Large, p. 707,) made on the 14th day of October, 1864, ratified by the Senate, with certain verbal amendments, July 2, 1866, and, after the Indians had consented to these amendments, in December, 1869, proclaimed by the President February 18, 1870. Under the provisions of Article I of this treaty, and of the executive order of March 14, 1871, issued thereunder, a tract of land, estimated to contain 768,000 acres, was set apart for the Indians, parties to the treaty, in the southern part of Oregon.

In September, 1865, while this treaty was pending before the Senate, Mr. Lindsley Applegate, sub-agent in charge of the Klamaths and Snakes, commenced operations for their benefit. The Modocs, presumed acting under advice of certain interested whites, had previously withdrawn from the country to their former home, near Clear Lake, sixty miles southeast of Klamath. They, however, informed Mr. Applegate, by messenger, that they would conform to his wishes, and in the event of the ratification of their treaty would come on the reservation.

During the ensuing year a part of this tribe, under their head-chief "Schon-chin" or "Skin-tian," were induced to settle quietly at the agency; Captain Jack's band, however, preferring to stay at their old homes, where, without serious outbreak, they remained until 1869. In the latter part of that year the amendments of the Senate to said treaty were presented for their acceptance, when Captain Jack made strenuous objections to the whole affair. He was, however, finally induced by the other chiefs to withdraw his opposition to the treaty, and in December of that year settled with his immediate followers upon the reservation. Within three months, troubles arose between the Modocs and the Klamath, due, in great measure, to the unfriendly disposition and conduct of the latter. The Modocs, under orders from Captain O. C. Knapp, United States Army, who, in October, 1869, had relieved Mr. Applegate as sub-agent, removed to another part of the reservation. Here disturbances were soon renewed, which resulted in the departure of the Modocs, who refused, as they said, to go into any traps for the benefit of their enemies, the Klamaths. Mr. A. B. Meacham, the then superintendent of Indian affairs for Oregon, attempted to settle the difficulties by establishing at Camp Yainax, in a distant part of the reservation, a sub-agency for the Snakes and others, leaving the Klamaths alone at the regular agency. But this measure, so far as it concerned the seceding and more turbulent portion of the tribe under Captain Jack's leadership, failed of its object. In his annual report for 1871, Superintendent Meacham recommended the establishment of the band on a reservation to be set apart for them near their old home, where they could be subjected to governmental control and receive their share of the benefits of the treaty. The tract indicated by him was six miles square, lying partly in Oregon and partly in California. No action on this recommendation was ever taken by this Department.

To avert an outbreak, which the superintendent deemed imminent, two commissioners, acting under his instructions, held consultations with these Indians in the summer of 1871, as the result of which it was understood that they should be permitted to remain at their present location awaiting definite action by this office in regard to their reservation, provided always that they refrained from theft and disturbance.

By reference from the honorable the Secretary of War, this office was, on the 21st of March last, placed in possession of copies of an extended correspondence which had been conducted between the military officers, the Oregon State authorities, and the superintendent of Indian affairs in that State, in which the danger of serious troubles was set forth and acknowledged by all these officials, and from which it was apparent that the military, while disposing the troops to insure the greatest protection to the citizens, yet felt themselves restrained from active operations against the defiant Indians under the agreement made by Superintendent Meacham in regard to the reservation, although Superintendent Meacham's successor, Mr. T. B. Odeneal, held that Captain Jack had forfeited by his maraudings all claim to consideration under that agreement.

A letter of instructions relative to the whole subject at issue, and covering copies of these papers, was forwarded to Superintendent Odeneal on the 12th of April last. Upon the receipt of his reply of June 17, 1872, and its inclosures, he was, under date

of July 6, ordered to effect the removal of these Indians, by force if necessary, to the Klamath reservation.

Copies of these three communications, and of Superintendent Odeneal's communication of the 23d ultimo, in which he reports at length in regard to these difficulties, are herewith forwarded for the information of the Senate. The papers referred to this office from the War Department, with other papers bearing upon this subject, also on file in this office, are voluminous, and, as their substantial import has been shown above, it has not been thought advisable to delay this report for the purpose of making copies of them. Such copies will, however, be furnished if desired. The resolution of the Senate is herewith returned.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

The Hon. the SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR, OFFICE OF INDIAN AFFAIRS,
Washington, D. C., April 12, 1872.

SIR: I inclose herewith copies of papers received by this Department, by reference from the honorable Secretary of War, in reference to the hostile attitude of, and apprehended trouble with, the Modoc tribe of Indians.

You are instructed to have the Modoc Indians removed, if practicable, to the reservation set apart for them under the treaty concluded with said Indians October 14, 1864; and, if removed, to see that they are properly protected from the Klamath Indians. If they cannot be removed to or kept on the reservation, you will report your views as to the practicability of locating them at some other point, and, if favorable to such location, you will give a description, by natural boundaries, if no other can be given, of the reservation that should be set aside for them.

Very respectfully, your obedient servant,

F. A. WALKER,
Commissioner.

T. B. ODENEAL, Esq.,
Superintendent Indian Affairs, Salem, Oregon.

OFFICE SUPERINTENDENT OF INDIAN AFFAIRS,
Salem, Oregon, June 17, 1872.

SIR: In answer to your letter of the 12th of April last, inclosing copies of papers from the honorable Secretary of War in reference to the hostile attitude of, and apprehended trouble with, the Modoc Indians, I have the honor to report that, in pursuance of your instructions therein contained, I at once directed Agent Dyar, of Klamath agency, and Ivon D. Applegate, commissary in charge of Camp Yainax, to meet the chiefs and head-men of said tribe of Indians, and endeavor to persuade them to go upon Klamath reservation, authorizing the assurance to be given that they should be fully protected. A council was held with said Indians on the 14th ultimo, and the result thereof is contained in the report of Mr. Applegate, a copy of which is herewith inclosed.

I referred the matter to the gentlemen named, for the reason that Mr. Applegate has for many years been intimately acquainted with these Indians, speaks their language fluently, and possesses their confidence to an extent greater than any one else.

The leaders of these Indians are desperadoes, brave, daring, and reckless, and their superior sagacity enables them to exercise full and complete control over the rest of the tribe. They have for so long a time been permitted to do as they please, that they imagine they are too powerful to be controlled by the Government, and that they can, with impunity, defy its authority. This, in my opinion, is the whole secret of their insubordination. They must in some way be convinced of their error in this respect, by such firm, decided action as will leave no doubt in their minds in regard to the fact that we intend that they shall be obedient to law and faithful to their treaty obligations. This need not, and, with proper management, will not, require the use of force. When they shall have been thus convinced, we can, with reasonable hope of success, commence the work of civilizing and christianizing them, and transforming them into peaceable, self-controlling, and self-sustaining men and women.

Unless these leaders shall in some way be restrained from pursuing the reckless, defiant course they have heretofore been permitted to pursue, all theories in regard to their advancement in civilization must fail, and there is reason to apprehend serious trouble, and perhaps war, at no distant day.

As well might we expect our own youth to grow up in the practice of Christian virtues, under the tutorship of the "road agents" of Montana, or the "guerrillas" of Mexico, as to think of instilling any good into the minds of the Modocs while under the exclusive control, as they have been, of their present leaders.

I think the most effectual way to bring about a solution of these troubles, and maintain peace, is to take the head-men into custody, and hold them at some point remote from their tribe, until they shall agree to behave themselves. We deprive white men of their liberty as a reformatory measure, and it certainly could not be considered less humane to adopt the same course with these chiefs. Not long since I had a conversation with Major Elmer Otis, who was in command of the troops in the district including these Indians, in which he expressed the opinion that all trouble with them could be settled by arresting the leaders, and compelling the others to go upon Klamath reservation. His opinion, as well as that of Messrs. Applegate and Dyar, is, that Camp Yainax, on Klamath reservation, is the best place in that whole country for the Modoc Indians; that they will be as well contented and as easily kept there as at any other place that could be selected. I agree with them in this; and therefore respectfully report against the propriety of locating them elsewhere.

I do not believe it practicable to remove them to the Klamath reservation at this season of the year without using the military for that purpose; and then, if they should resist, I doubt whether there is sufficient force in that vicinity to compel them to go. Major Otis stated in the conversation I had with him that the peremptory order for them to go upon the reservation should not be made before the last of September, for the reason that it would be difficult to enforce such order before the commencement of winter.

It is the opinion of Major Otis and other military officers and citizens that a reservation should be selected on the head-waters of Malheur River, or in the Stein Mountain country, on which the Pi-Utes (or Snakes) should be located. I believe this practicable and advisable, but await orders from you in regard to it. It is estimated that there are five hundred Pi-Utes on the head-waters of the Malheur who have never been on any reservation, and two hundred more at Yainax, who desire to go back to where their people are, in the Malheur country.

Very respectfully, your obedient servant,

T. B. ODENEAL,
Superintendent Indian Affairs, Oregon.

Hon. F. A. WALKER,
Commissioner, &c., Washington, D. C.

CAMP YAINAX, May 8, 1872.

SIR: Your communication of April 27, relative to the Modocs and their permanent location, has been received, and I reply with no little embarrassment, for this is an old and vexed question, and one upon which there is much difference of opinion; in fact, any solution of the question will have its opponents.

In regard to moving the band to Klamath reservation and protecting them from the Klamaths, I give it as my opinion that the place is not only practicable, but is really the only policy that can be adopted with any hope of success; but it is reasonable to believe that they will not come on to the reservation peaceably while their present leaders are in power; at any rate, not until they are convinced that the military will be used against them in case of refusal. I feel confident that in winter they could be removed quite easily by the troops stationed at Fort Klamath, but at this season an attempt to bring them by force might be attended with considerable danger to the settlers now in that country. Yet I am inclined to the opinion that a positive order to remove to the reservation, made when a force of fifty or sixty cavalry can be at hand in their country, ready for immediate action, would have the desired effect, and that most, if not all, of the Modocs would obey; and even this plan of action might lead to a very destructive war, for the Indians, of whom there are at least fifty active, well-armed warriors, might get into the mountains adjacent to the scattering settlements, do a great deal of damage, and really be almost invincible until hemmed in again by the snows of next winter. They are well armed and clothed, well supplied with ammunition, and are undoubtedly encouraged by certain white men in Siskiyou County, who perhaps profit by their trade. The proposition to arrest the leaders is one worthy of serious consideration, and in this plan may lie the solution of the problem; but under the present understanding between the Department, both Indian and military, and the chief, Captain Jack, the arrest would no doubt be regarded by the Indians as an act of treachery on our part, and might hereafter destroy their confidence in the Indian Department to a great extent, and the military might be averse to taking any action while they consider the agreement made with Captain Jack by the late superintendent, A. B. Meacham, as still in force. The nature of which agreement was, as

you will see by records in your office, that, until the matter of setting apart a separate reservation for them should be adopted or disapproved, and the matter of their permanent location be positively determined by the Department, they should remain unmolested in the Modoc country, they, on their part, "doing nothing that would have a tendency to cause a collision between them and the settlers."

In a communication addressed to Superintendent A. B. Meachem, under date of February 17, 1872, General E. R. S. Canby says: "The commanding officer has been advised that the question of new location has been by you submitted to the Commissioner of Indian Affairs, and that, pending the decision of this question, force will not be used by the military to compel the return of the Modocs to the reservation," unless assured that the new location idea is abandoned, perhaps the military would not [obey] the order to arrest those men. If it could be arranged, it is my opinion that the arrest of Captain Jack, Black Jim, Scar-faced Charley, Boston, and En-choaks, the medicine-man, would settle all trouble, and I am satisfied that, if properly planned and managed, with *great caution*, it can be done with no very great risk and with a comparatively small force. Only for the appearance of being a breach of faith on the part of the Department, it could have no bad influence on the other Indians. As to their location elsewhere than on the Klamath reservation, I must say, in all candor, that I cannot consider such plan is either right or practicable. Allow me here to give a few reasons for so thinking: The Modocs, as parties to the treaty of October 14, 1864, ceded to the United States the very country over which they are now roving. Their right being thus extinguished, the country was thrown open to settlement. Much of it has been located as State land, and nearly every foot of it fit for cultivation has been taken up by settlers, whose thousands of cattle, horses, and sheep, are ranging over it. The country where those Modocs are is a pastoral region, not an agricultural country; and to undertake to maintain them on a small reservation there would probably cost more than to provide for them and the Klamaths on this reservation, which is so well fitted, by its various resources, as a home for them.

These Modocs really are only a fragment of the Klamath Nation, having common sympathies, speaking the same language, and being closely intermarried with the several bands on the reservation, and if located on a new reservation a constant and annoying intercourse would be the effect; and their success in being located there, in violation of treaty stipulations, would have a demoralizing influence on the other Indians.

The white settlers are very much opposed to establishing a new reservation for this band of desperadoes, and their determined opposition would keep up a continual conflict, even though the location should be made, and likely would be sufficient to make the thing a failure in the end. Chief Skin-tian, formerly recognized as chief of all the Modocs, now an old man, still remains here with over a hundred of his tribe, still faithful to his obligations, and still anxious and hopeful that his people, who have been led away by Captain Jack, will be brought back where they belong. Through Skin-tian's people I shall immediately send word to Captain Jack, asking him to meet Mr. Dyar and I, without delay, on Lost River, and the result of the council will be reported to you as soon as possible after it occurs.

Very respectfully, your obedient servant.

I. D. APPLEGATE,
Commissary in Charge.

Hon. T. B. ODENEAL,
Superintendent Indian Affairs, Salem, Oregon.

YAINAX, May 16, 1872.

SIR: Under date of May 8 I wrote you in answer to your letter of inquiry in regard to the Modoc matter, and I would now most respectfully report further, that on the 14th instant, in company with Mr. L. S. Dyar, agent at Klamath, I met the chiefs and headmen of all the Modocs, both those under Skin-tian and Captain Jack, at the military camp on Lost River. I used every argument to induce them to return peaceably to the reservation, telling them that this was the desire of the Department; that such action would insure them all the rights and privileges now enjoyed by the other Indians on this reservation, and that they would have perfect protection against the Klamaths.

I did not think it warranted by my instructions, nor was it, in my judgment, prudent, to demand of them to return, or even to say to them that they would have to come, considering that at this season hostilities would certainly result in great loss of life and property. I was not willing to make any issue, but thought it best to leave the matter of their final settlement still open, feeling satisfied and still hoping for success, based on their good conduct, they will be more likely to remain peaceable. I asked Captain Jack if he would obey the order to come on to the reservation, but he did not answer pointedly. While he hesitated, Black Jim and several others told him in their own language that it might be dangerous to say no. Jack then said that he

would not answer the question, for it would make a "dispute." Considering all things, I did not think it best to press the question further. Jack's speech was substantially as follows:

"We are good people, and will not kill or frighten anybody. We want peace and friendship. I am well known and understood by the people of Yreka, California, and am governed by their advice. I do not want to live upon the reservation, for the Indians there are poorly clothed, suffer from hunger, and even have to leave the reservation sometimes to make a living. We are willing to have whites to live in our country, but we do not want them to locate on the west side and near the mouth of Lost River, where we have our winter camps. The settlers are continually lying about my people, and trying to make trouble."

I feel quite safe in saying that there is not much probability of any serious trouble from these Indians, as matters now stand; but if the cavalry force is ordered away before winter there will be great danger of open hostility. Any action against them in the summer will be attended with more or less danger.

One very bad feature in the matter is the fact that there is a very bitter feeling among the settlers against the Modocs. The delay in removing them has made some of the settlers almost desperate, and it is hard to reason with such people, and keep them from doing some act that might bring on a general massacre. And yet it might, perhaps, be safest to risk this, and let the matter rest till winter.

Very respectfully, your obedient servant,

I. D. APPLGATE,
Commissary in Charge.

Hon. T. B. ODENEAL,
Superintendent Indian Affairs, Salem, Oregon.

DEPARTMENT OF THE INTERIOR, OFFICE OF INDIAN AFFAIRS,
Washington, D. C., July 6, 1872.

SIR: I have received your report, dated the 17th ultimo, inclosing copies of letters from I. D. Applegate, dated, respectively, the 8th and 16th of May last, in reply to a communication from this office, dated April 12, 1872, relative to the removal of the Modoc Indians to the Klamath reservation, or the propriety of having a new reservation set apart for them.

In your report you state "that it is the opinion of Major Elmer Otis, as well as that of Messrs Applegate and Dyar, that Camp Yainax, on Klamath reservation, is the best place in that whole country for the Modoc Indians; that they will be as well contented and as easily kept there as at any other place that could be selected," and you agree with them in their opinion, and report against the propriety of locating them elsewhere. You further state that the leaders of the Modoc Indians are "desperadoes, brave, daring, reckless," and defy the authority of the Government with impunity, and that it will be necessary to arrest these leaders and convince them of their error, before any civilizing influences can be brought to bear upon the tribe.

Your recommendations, so far as the Modoc Indians are concerned, are approved, and you are directed to remove them to the Klamath reservation, peaceably if you possibly can, but forcibly if you must, at the time suggested in your report, in September next. You will exercise your discretion about making arrests of the leaders, avoiding any unnecessary violence or resort to extreme measures.

You also report that it is the opinion "of Major Otis, and other military officers and citizens, that a reservation should be selected on the headwaters of the Malheur River, or in the Stein Mountain country, on which the Pi-Utes (or Snakes) should be located. You believe this practicable and advisable, and estimate that there are five hundred Pi-Utes who have never been on any reservation, and two hundred at Yainax, who desire to go back where their people are, in the Malheur country.

In reply to this part of your report, you are directed to examine the country at the headwaters of the Malheur River, and report, by natural boundaries, a sufficient quantity of land for a suitable reservation for said Pi-Ute or Snake Indians. You will be careful not to embrace any more territory than is necessary, and not to interfere with white settlements, if there are any in that locality.

Upon receipt of such report, the matter will receive proper consideration by this office.

Very respectfully, your obedient servant,

F. A. WALKER,
Commissioner.

T. B. ODENEAL, Esq.,
Superintendent Indian Affairs, Salem, Oregon.

OFFICE SUPERINTENDENT INDIAN AFFAIRS,
Salem, Oregon, December 23, 1872.

SIR: In your letter of the 6th of July last, you directed me to remove the Modoc Indians to Klamath reservation, peaceably if I could, but forcibly if I must. For the purpose of executing this order, I left here on the 20th of November, and arrived at Klamath agency on the 25th of the same month. Learning that Captain Jack's band of Modocs was then camped on Lost River, I immediately dispatched Messenger James Brown and I. D. Applegate to said camp with the following message:

"Say to them that I wish to meet the head-men at Sink River on the 27th instant, and to talk with them. Impress upon them the importance of their meeting me. Tell them that I entertain none but the most friendly feelings for them, and that the object of the interview sought is to advance their interests and promote their welfare; that I have made ample provision for their comfortable subsistence at Camp Yainax, on Klamath reservation, and desire to have them go there and receive their proportion of the annuities; that if they will go with you to the reservation within a reasonable time, as soon as they can get ready, they shall be fairly and justly dealt with, and fully protected in all their rights against any injustice which other tribes might be disposed to do them. If they agree to go with you, say to them that they need not meet me as requested, and that I will see them at Yainax. In the event they decline to go to the reservation, you will say they must meet me at Sink River, as I desire to and must come to a positive understanding with them."

On the same day I addressed the following letter to Lieutenant-Colonel Wheaton, commanding the district of the lakes:

"OREGON SUPERINTENDENCY,
"Klamath Agency, November 25, 1872.

"SIR: I am here for the purpose of putting the Modoc Indians upon this reservation, in pursuance of an order from the honorable Commissioner of Indian Affairs, a copy of which is as follows, to wit: 'You are hereby directed to remove the Modoc Indians to Klamath reservation, peaceably if you possibly can, but forcibly if you must.' I have requested the head-men of the tribe to meet me at Sink River on the 27th instant, at which time I shall endeavor to persuade them to return to the reservation. If they shall refuse to come voluntarily, then I shall call upon you for a force sufficient to compel them to do so. They have some eighty well-armed warriors, and I would respectfully suggest that as large a force be brought to bear against them at once as you can conveniently furnish, in the event it shall be determined that they cannot be removed peaceably.

"Immediately after the conference referred to, I will inform you of the result thereof, and in the mean time I have to request that all necessary preliminary arrangements be made for concentrating the forces at your command and having them ready for active operations.

"Very respectfully, your obedient servant,

"T. B. ODENEAL,
"Superintendent Indian Affairs, Oregon.

"Lieutenant-Colonel FRANK WHEATON,
"Commanding District of Lakes, Camp Warner, Oregon."

My plan was, if they could not be removed peaceably, to bring so large a force against them as to overawe them at once, and thus insure the execution of the order without fighting.

Lost River is fifty-five miles from Klamath agency, twenty-three miles from Sink River. On the day appointed, in company with Agent L. S. Dyar, I went to the place designated for the meeting, and there met the messengers, who reported that they had been to the camp of Captain Jack's band of Modocs, and had informed the head-men of everything contained in my instructions, and, besides, had used every argument in their power to persuade them to meet me or go upon the reservation. That they peremptorily declined to do either. Captain Jack, the head-chief, made substantially the following speech:

"Say to the superintendent that we do not want to see him or to talk with him. We do not want any white man to tell us what to do. Our friends and counselors are men in Yreka, California. They tell us to stay where we are, and we intend to do it, and will not go upon the reservation. I am tired of being talked to, and am done with talking."

After fully considering and discussing the matter with Agent Dyar and Mr. Applegate, and receiving from them the positive opinion that nothing but the appearance of an armed force at their camp could have any influence whatever upon them, I concluded to call for such force, and accordingly sent Mr. Applegate to Fort Klamath, with the following letter, which I authorized him to deliver to Major John Green, commanding that post, and, if he had not sufficient authority and force to act, to forward the same to Colonel Wheaton, to wit:

"OREGON SUPERINTENDENCY,
"Sink River, November 27, 1872.

"SIR: The bearer of this, Mr. I. D. Applegate, has just returned from the camp of the Modoc Indians, and he informs me that they defiantly decline to meet me at this place, in accordance with my request, sent by him. They authorized him to say that they did not desire to see or to talk with me, and that they would not go upon Klamath reservation. In order, therefore, to carry out the instructions of the honorable Commissioner of Indian Affairs, I have to request that you furnish a sufficient force to compel said Indians to go to Camp Yainax, on said reservation.

"I transfer the whole matter to your department, without assuming to dictate the course you shall pursue in executing the order aforesaid, trusting, however, that you may accomplish the object desired without the shedding of blood, if possible to avoid it.

"If it shall become necessary to use force, then I have to request that you arrest Captain Jack, Black Jim, and Scar-faced Charley, and hold them in custody subject to my order.

"I am informed that these leaders, with only about half of their warriors, are camped near the mouth of Lost River, and if the force could be immediately sent to that place, I think they might be induced to surrender and come upon the reservation without further trouble.

"Very respectfully, your obedient servant,

"T. B. ODENEAL,
"Superintendent Indian Affairs, Oregon."

This letter was addressed to no one on the inside, but was sent to Major Green, with instructions to the bearer, Mr. Applegate, to address it to Colonel Frank Wheaton, Camp Warner, in the event Major Green had not authority and force sufficient to enable him to act. He had told me on the 26th that he had orders to act, but I did not learn to what extent. I am informed that my letter, or a copy of it, was immediately forwarded to Colonel Wheaton.

On the 28th of November, at 5 o'clock p. m., a special messenger delivered to me a letter from Major Green, a copy of which is as follows:

"HEADQUARTERS FORT KLAMATH,
"November 28, 1872.

"SIR: In compliance with your written request of yesterday, I will state that Captain Jackson will leave this post about noon to-day with about thirty men; will be at Sink River to-night, and I hope before morning at Captain Jack's camp.

"I am, sir, very respectfully, your obedient servant,

"JOHN GREEN,
"Major First Cavalry, Commanding Post.

"Mr. T. B. ODENEAL,
"Superintendent Indian Affairs."

The impression seemed prevalent among military men and some others that, on account of the weather and other adverse circumstances surrounding the Indians, they would surrender and go to the reservation as soon as they saw that there was a probability that troops would be used against them if they should refuse to go.

This force was, in my estimation, too small, and as soon as I received Major Green's letter I sent James Brown, messenger in this office, in company with a man named Crawley, who lived within a quarter of a mile of the camp of the Modocs, to notify all settlers who could be in any danger in the event of an unsuccessful engagement with the Indians that the cavalry were coming. They notified several families, who went with them to Crawley's house, arriving there at half-past twelve o'clock that night. Mr. Brown knew nothing of other settlers living below Crawley's. There were six men then with him; all were acquainted with the country; no one said anything about there being other settlers who might be in danger. Mr. Brown also says that all could have been notified easily before daylight, and if this had been done no one could have been murdered. Eleven men in all were murdered—four within three miles of where the messengers stopped on the day of the battle, four within ten miles, and three within fourteen miles the day following. I state facts only. Feeling conscious that I did everything in my power to avert all danger, and knowing that blaming others cannot bring the dead to life or relieve the anguish of surviving friends, I shall offer no words of censure against any one for the sad results.

Learning that the troops would not come by way of Sink River, I, at 1 o'clock in the morning of the 29th, went to a point on the road which they would pass some three miles distant, and there gave Captain Jackson, at his request, verbal directions in substantially the following words, viz:

"When you arrive at the camp of the Modocs, request an interview with the head-

men. Say to them that you did not come to fight, or to harm them, but to have them go peaceably to Camp Yainax, where ample provision has been made for feeding and clothing them, and where, by their treaty, they agreed to live; use every argument you can to induce them to go; portray to them the folly of fighting; talk kindly, but firmly, to them; and, whatever else you may do, I desire to urge that if there is any fighting let the Indians be the aggressors. Fire not a gun, except in self-defense, after they have first fired upon you or your men."

The troops arrived at the camp at 7 o'clock in the morning, obtained an interview, and a conversation ensued lasting three-quarters of an hour. Captain Jackson has since informed me that he repeated to them all I requested him to say, and used every argument he could to induce them to go. All proving ineffectual, he demanded of them to lay down their arms, when one of the leaders, "Scar-faced" Charley, raised his gun, and, with an oath, saying he would kill one officer to begin with, fired at Lieutenant Boutelle, who was in front of his men, shooting four bullet-holes through his coat-sleeve. The Indians all had their guns in their hands, and a general firing commenced at once on both sides. The battle lasted two hours, when the Indians escaped, but returned again in the afternoon and attacked the troops.

The murders of the citizens were all committed by five men and one woman. All can be identified. The matter being in the hands of the military, I have of course exercised no control since the battle, further than to suggest that the terms of surrender should be that they lay down their arms and go and stay upon the reservation.

I have requested, further, that the leaders be taken into custody and held subject to further orders, and that the murderers be taken charge of and delivered to the civil authorities to be dealt with according to law.

A very few individuals, who can assume a very fervent enthusiasm whenever the occasion requires it, but whose motives are supremely selfish, may say (have said in fact) that this collision might have been avoided. Ninety-nine out of every hundred men in this State who know the facts would express a different opinion—the fact of their refusing to talk with me; their peremptory refusal to go to the reservation at my request, or at the request of the military; and the final and most convincing of all other facts, the opening of hostilities against men who were endeavoring to convince them that they were their friends and desired only their welfare. The military purpose pursuing until they capture them. I believe this the only safe way to do. Should the troops return to their posts, these Indians would regard it as a defeat of the Government; their insolence and defiance would become still more intolerable, and a guerrilla warfare would be waged until every settler in that region would be murdered; and other Indians, now peaceable, seeing their success, would hasten to join them. Another result would be the most gigantic Indian war of modern times.

While residing with a Quaker agent, Mr. Harvey, of Pennsylvania, in the Osage Nation, twenty-two years ago, I became impressed with the idea, and still believe, that as a general rule Indians can be governed and controlled most successfully by peaceable means. Since that time I have resided in the immediate vicinity of Indians, and been familiar with the character of various tribes and nations, and I find that all of them, in their native condition, regard white men as their natural enemies. In this they are not altogether unreasonable, in view of the sentiment of extermination which is so prevalent on the frontiers. This idea is so firmly impressed upon their minds, that it can be eradicated only by a policy such as the Government is now pursuing, and not by this in a day or even a year. Considerable time must elapse before their prejudices can be removed and substituted by feelings of friendship and good-will toward our race. It is difficult to make them forget a wrong. They will not love their enemies. They will lie to you, but you must promise them nothing you cannot give. If you should declare that you would punish them for some short-coming and not do it, they would think much less of you, and a few repetitions would cause them to lose all faith in your promises and in you. This is a characteristic of all Indians I ever knew. They are not very truthful, but want all who deal with them to be so. They should be dealt with kindly and humanely, but more as if they were children than men, until they can be educated in the ways and habits of civilized life. The Government should faithfully perform all its promises, and as a father enforces his rules and mandates, so should they be made to fulfill their promises and agreements.

Believing, as I ever have, that many acts of injustice have, in the past, been committed against them by representatives of the Government, as well as by individual white men, all my sympathies are enlisted in their favor when I see any attempt to trample upon or disregard their rights. I can make all due allowance for the ignorance which their habits, condition, and want of opportunity to become enlightened have entailed upon them. But there are exceptions to all rules. A majority of the Modocs have, for years, been residing upon the reservation, and demeaning themselves properly, while Captain Jack, disregarding the counsel of the head-chief, Scon-chin, has persisted in roaming whithersoever he pleased, taking as many others with him as he could persuade to go. No injustice has ever been done the Modocs, that I am aware of, though they have been bad Indians in the past, having murdered helpless emigrants

passing through their country, by the score. Captain Jack and other leaders of this band are not educated in books, but for good natural common sense I believe them not inferior in intellect to ordinary white men. They are educated in all the vices of our race, and have no apparent desire for any other kind of knowledge. It is not ignorance which impels them to pursue the course they do. They know better, but, like many white men, are outlaws, having no respect for the rights of others, and being destitute of all moral principle. They boast of the number of people they have killed, (both Indians and whites.) There are enough of them to demoralize all the Indians in that part of the State, and I believe that to subdue them now is not only the most merciful and christianlike, but the only safe way to deal with them. For eight years they have been permitted to baffle and defy the Government in the course desired to be pursued for their benefit, until many Indians on the reservation, familiar with their conduct, were becoming discontented, and soon would have fled from the restraints, as they consider them, connected with living at an agency. The good of all Indians in that part of the State demanded that your order be executed without further delay. I tried to carry out your instructions peaceably. Persuasive measures proved fruitless. The military tried to effect the desired object, by both argument and intimidation. All failed. The Indians commenced hostilities, and now, I think, no terms should be made with the band which could in any way interfere with afterward arresting and removing the leaders, and the trial of the murderers. If they should consent to all go upon the reservation, and the chiefs be permitted to remain with them, there would be a repetition of these troubles at least once a year as long as there should be one of them left.

Since you first ordered these Indians to be removed, I have received many letters from citizens, some addressed to me, and some by reference from the governor, complaining of Captain Jack's band and asking for relief.

The Indians were becoming more insolent every day. When they wanted a barrel of flour or a beef, they would go and demand it of the nearest settler, who was afraid to refuse, and gave them whatever they called for. A dozen or more would go into a house, demand their supper, breakfast, or dinner, and the frightened women, not daring to refuse, would prepare the meal for them, while they lounged around on the beds, or sat and smoked by the fire. The lands had been taken by settlers under the pre-emption law, yet the Indians claimed it, and would demand and take half the hay, grain, &c., as rent.

I have sufficient evidence to satisfy me that there are a few men in Yreka, California, some sixty miles from Lost River, who are to a great extent, if not entirely, responsible for the insubordination of Captain Jack's band, and for the present trouble with them. There are several letters in existence which go to show these men have persuaded them to remain off the reservation, making them believe that they could hold the land they claim under the pre-emption law, if they would stay where they were, but that if they went to the reservation they would lose all right to it. On the evening before the battle, one of the letters I refer to was given to me by a settler, (who had found it with some others,) and is in the words and figures following :

“ YREKA, September 19, 1872.

“DEAR SIR: You will have to give me a description of the land the Indians want. If it has been surveyed, give me the town, range, section, and quarter-section. If not, make a rude plat of it, by representing the line of the lake and the line of the river, so that I can describe it.

“ Mr. Varnum, the county surveyor, will not go out, so I have to send to Sacramento to get one appointed. Send me an answer by an Indian, so that I can make their papers soon. I did not have them pay taxes yet, as I do not know whether the land is surveyed and open for pre-emption.

“ Respectfully, yours,

• “E. STEELE.

“ Mr. HENRY F. MILLER.”

Other letters which parties have promised to send me have been found, and are said to be more full and explicit than this.

The friends and counselors referred to by Captain Jack have supplied the Indians with the best of guns and an abundance of ammunition, to enable them to remain off the reservation. They will, of course, find great fault with the authorities for interfering with their customers. They have evidently made a large amount of money by their illicit traffic, and their only desire was to make more, caring nothing for the ultimate fate of the Indians. E. Steele is said to be a prominent lawyer. Among others implicated is a judge of the State court. I propose to investigate this matter fully, for my own satisfaction, whether it amounts to anything beyond or not. It is my experience that nine-tenths of the trouble with Indians in this superintendency is brought about by meddlesome white men giving them improper advice and dealing illicitly with them. We are endeavoring to put a stop to these things as fast as we can find cases which can be successfully prosecuted in the courts.

The latest news I have from the Modoc country is to the effect that there has been no fighting since the first battle, and no depredations have been committed since that time.

This may be considered an inexcusably long report, but I could not give you all the facts and my views in fewer words.

Very respectfully, your obedient servant,

T. B. ODENEAL.

Hon. F. A. WALKER,
Commissioner, &c., Washington, D. C.

○

PURCHASE OF LAND AT OMAHA, NEBRASKA.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A draught of a bill to confirm the purchase by the Executive Department on the 8th September, 1868, of a certain tract of land at Omaha, Nebraska.

FEBRUARY 11, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT, *February 7, 1873.*

The Secretary of War has the honor to submit to the House of Representatives a draught of a bill to confirm the purchase by the Executive Department, on the 8th September, 1868, of a certain tract of land at Omaha, Nebraska, and to recommend its passage.

The property, consisting of twenty acres, was purchased by Major William Myers, quartermaster, for \$8,000, under orders of his department and division commanders.

The necessity for a depot and barracks at Omaha was approved by the then Secretary of War, Mr. Stanton, and the citizens of Omaha donated the sites, which were approved by the department commander, General C. C. Augur. On a personal examination by the General of the Army, W. T. Sherman, in 1868, he found the donated tract of forty-two acres insufficient, and a contract being at the time in existence for the erection of barracks, he authorized the purchase, at \$200 per acre, of forty more acres, which have been ever since in the occupation of the United States. On this eighty-two acres are erected valuable buildings, and the land is worth far more than the amount paid for it.

In order that the officer who made this purchase may be relieved from further responsibility, I ask for the bill speedy and favorable consideration.

A copy of a previous letter of this Department, dated January 6, 1869, to the Speaker of the House of Representatives, relative to this matter, is herewith inclosed.

WM. W. BELKNAP,
Secretary of War.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of the United States is hereby given to the purchase of a certain tract of land at Omaha, Nebraska, for which, under order of his commanding officer, Major William Myers paid the sum of \$8,000; and the accounting officers are directed to credit him, in settlement of his accounts, with the sum of \$8,000, upon the filing of satisfactory vouchers showing the payment of that sum to have been made by him under such order.

WAR DEPARTMENT, *January 6, 1869.*

The Secretary of War has the honor to submit to the House of Representatives the accompanying copies of a correspondence between the War Department and Lieutenant-General Sherman, relative to the purchase of certain land at Omaha, Nebraska, in addition to that already donated to the United States for the erection of military barracks in that city, and to recommend that, as the land in question is required for the public service, its purchase, out of any appropriation applicable to the same and subject to existing requirements of law governing the purchase of land by the United States, be authorized by Congress.

J. M. SCHOFIELD,
Secretary of War.

The SPEAKER of the House of Representatives.

C

JOHN J. CLADECK.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

The joint resolution (H. Res. 114) for the relief of John J. Cladeck, late colonel Thirty-fifth New Jersey Volunteers.

FEBRUARY 11, 1873.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT, *January 10, 1873.*

The Secretary of War has the honor to report to the House of Representatives, for the information of the Committee on Military Affairs, in reply to letter of said committee of the 31st ultimo, inclosing the joint resolution (H. Res. 114) for the relief of John J. Cladeck, late colonel Thirty-fifth New Jersey Volunteers, and requesting information as to his history, record, and services, that John J. Cladeck was mustered into the military service of the United States as colonel Thirty-fifth New Jersey Volunteers, October 14, 1863.

He was tried by general court-martial July 24, 1865, and the sentence "to be dishonorably dismissed the service of the United States, and to forfeit to the United States all pay and allowances now due or to become due," promulgated in General Orders No. 112, Headquarters Department of Washington, August 12, 1865, was duly executed.

The resolution proposes to grant him pay and allowances from May 31, 1865, the date of last payment, to August 12, 1865, the date of the promulgation of his sentence, including the three months' pay proper, (nearly \$700.)

The inclosed official copy of the report of the Judge-Advocate-General, dated September 13, 1865, in answer to a reference of the case to him by the Executive, gives a succinct account of the facts in the case.

The Department cannot recommend favorable action.

WM. W. BELKNAP,
Secretary of War.

BUREAU OF MILITARY JUSTICE,
September 13, 1865.

John J. Cladeck, colonel Thirty-fifth New Jersey Volunteers, was tried by general court-martial at Washington, D. C., July 24, 1865, on a charge of conduct to the prejudice of good order and military discipline.

The first specification alleged that "said Colonel Cladeck did allow and permit George H. Moore, a citizen, to come within the limits of the Thirty-fifth New Jersey Volunteers, and to take the pay-rolls of Company G, of said regiment, and pay that company, and to deduct ten per cent. of the money due enlisted men therein, for State and local bounty, he, said Colonel Cladeck, knowing that the regiment was to be paid by the regular paymaster within a few days.

"That these payments by Moore caused such dissatisfaction among the men that they deserted to the number of nearly one hundred men."

The second specification, after repeating the facts above narrated, alleged "that Colonel Cladeck, in consequence of the privilege granted to Moore, did receive from him the sum of \$335."

The accused pleaded not guilty to the charge and specifications; was found guilty, with the exception of the words "and causing such dissatisfaction among the men that they deserted to the number of nearly one hundred."

The evidence on the trial disclosed that the accused, after having been notified by his brigade commander that his regiment would be paid off in a few days, permitted Moore to pay off some of the enlisted men of his command, all the pay due them upon the rolls, with the exception of ten per cent. deduction from the amount of local and State bounty. That Moore obtained the pay-rolls of the regiment; that men of Company G signed them; and while Moore was paying them, General Barnum, hearing of the transaction, came to the tent where Moore was operating, and put an end to the payment. That Colonel Cladeck subsequently borrowed of Moore the sum of \$335 to pay off an indebtedness to the Government, which had accrued by reason of his applying deserters' funds, in his hands, to the purchase of necessaries for his regiment, a disbursement decided by the proper authority to be unwarranted.

While the payment of the men was progressing, Colonel Cladeck passed the door of the tent, and, in answer to some complaints, told the men not to receive the money, except they were paid in full, unless they chose so to do; that he would not oblige them to take it, and that they were entitled to every cent they were mustered for.

Both Moore and the accused continually notified the men that they would be paid off within a few days.

The accused now makes application to his Excellency the President of the United States, asking that a review of his case be had, and that he be honorably discharged the service. He bases his application upon the ground that much of hearsay evidence was received upon the trial, and that the evidence was clearly insufficient to convict him. He claims that the money paid by him for the use of the regiment, out of deserters' money, in his hands, was disbursed by order of a council of administration, and that the money borrowed from Moore was all paid over to Lieutenant-Colonel Potter, paymaster United States Army, to make up his deficiency. He asks that reference be had to the papers now on file in the Adjutant and Paymaster General's Offices to prove these allegations.

Colonel Cladeck alleges that he has served as an officer in the Hungarian revolution; that, on the breaking out of this rebellion, leaving a lucrative business and his family, he enlisted as a private in a three-months regiment, and was promoted to a first lieutenantcy; that he afterwards served as a captain in the Fifth and Thirtieth New Jersey Regiments for two years, and was appointed colonel of the Thirty-fifth New Jersey, on or about the 1st of October, 1863; served in command of a brigade under Major-General W. T. Sherman, in his Mississippi campaign; that he has received a wound that has disabled him for life from pursuing his former profession; that he was engaged in all the battles and skirmishes of General Sherman's campaign in Georgia; and that, near Decatur, his regiment saved the entire army from being captured; that during the four years and four months he has been in the service, he has never before been under arrest nor absent without leave.

He concludes by saying that, in whatever light the irregular transaction of Moore may be received, he (the accused) was not guilty of any designed dereliction of duty amounting to a criminal offense.

He asks, therefore, that his sentence may be remitted so that he can return to his wife and family without disgrace.

Indorsements upon an application of Colonel Cladeck to recruit his regiment, signed by General Sprague, his brigade commander, Brigadier-General T. E. G. Ransom, and Brigadier-General J. W. Fuller, are forwarded with the letter. They speak of the great gallantry of the Thirty-fifth New Jersey, and of Colonel Cladeck, its commander, as a thorough soldier, who has won the esteem and confidence of all who have served with him.

The objections taken to the character of the evidence by the accused were not raised on the trial. The record discloses that nearly all the hearsay testimony, and there was but little of it, formed a part of the *res gesta*, and was not of a nature to materially damage his case. The evidence was sufficient to establish the fact that Moore paid off part of Company G, by permission, at least with the knowledge and consent of Colonel Cladeck, and that the accused borrowed \$333 of him.

It does not appear necessary to examine the records of the Adjutant and Paymaster General's Departments as requested; for, conceding all the facts alleged to be contained therein, the accused is still guilty of conduct greatly in violation of good order and military discipline. He was commander of a regiment, not only, but the protector and guardian of all the rights and interests of every man of his command. It was disreputable for an officer of his high rank to permit this broker to make money out of the impatience and folly of his men, and, learning of his purposes, he should have ordered him out of his regimental lines.

But he consented to the plans of Moore, knew of the fact that he was shaving the men of ten per cent. of a claim which would be paid in full within a few days, and took no steps to protect them beyond a notification that he would not compel them to accept the reduced pay. He borrowed money of this man. No matter under what pressure or for what laudable purpose he obtained it, Moore was the last man to whom he should have applied for assistance. Any business relations, within the limits of his command, with one who came there for the avowed purpose of plundering enlisted men, was disreputable.

His acquiescence in such a scheme of plunder, by neglecting to arrest the perpetrator and prevent the holders of a just claim against the Government from being robbed of any portion of it, was a violation of the obligation to those whom it was his clear duty to protect, even from the consequences of their own folly.

The record of this case, sustaining, as it does fully, the findings and sentence of the court, will not justify this Bureau in recommending the exercise of executive clemency.

J. HOLT,
Judge-Advocate-General.

To the PRESIDENT.
Official:

THOMAS M. VINCENT,
Assistant Adjutant-General.

O

EPHRAIM P. SHOWALTER.

LETTER

FROM

THE SECRETARY OF WAR,

RETURNING

The bill (H. R. 1611) for the relief of Ephraim P. Showalter.

FEBRUARY 11, 1873.—Referred to the Committee of Claims and ordered to be printed.

WAR DEPARTMENT, *February 8, 1873.*

The Secretary of War has the honor to report to the House of Representatives, for the information of the Committee on Military Affairs, as requested by letter of said committee of the 31st ultimo, that Ephraim P. Showalter was drafted in the sixth district of Indiana, September 26, 1864, and mustered into service November 16, 1864. On the 18th November, 1864, he was forwarded from rendezvous to the field, where he was assigned to Company D, Thirtieth Indiana Volunteers, with which regiment he served until July 5, 1865, when he was discharged.

The records of the acting assistant provost-marshal general's office, Indianapolis, Indiana, (now on file in the War Department,) show that Henry Wilson was placed in the naval service for two years, at Cincinnati, Ohio, December 2, 1864, as a substitute for Ephraim P. Showalter, drafted in Moral Township, Shelby County, (sixth district,) Indiana.

There is no record in the War Department of the fact and time of service rendered by Henry Wilson. The records of the Navy Department may furnish this information.

The bill (H. R. 1611) for the relief of Ephraim P. Showalter is herewith returned.

WM. W. BELKNAP,
Secretary of War.

Mr. JEREMIAH M. WILSON, on leave, introduced the following bill :

A BILL for the relief of Ephraim P. Showalter.

Whereas Ephraim P. Showalter was drafted into the service of the United States on the twenty-sixth day of September, eighteen hundred and sixty-four, for the period of one year, and on the eighteenth day of November, eighteen hundred and sixty-four,

was mustered into the service of the United States, in Company D, Thirtieth Regiment Indiana Volunteer Infantry; and whereas, on or about the second day of December, eighteen hundred and sixty-four, the said Showalter furnished, and caused to be mustered into the service of the United States, a substitute for two years, paying therefor the sum of one thousand dollars; and whereas, notwithstanding he furnished said substitute, said Ephraim P. Showalter was held to service until the 23d day of June, eighteen hundred and sixty-five: Therefore,

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and he is hereby, authorized and directed to pay to said Ephraim P. Showalter the sum of one thousand dollars out of any money in the Treasury not otherwise appropriated.

O

APPROPRIATIONS FOR SIOUX INDIANS.

LETTER

FROM THE

SECRETARY OF THE INTERIOR,

RELATIVE TO

A deficiency in the appropriation for the subsistence of the Sioux Indians.

FEBRUARY 13, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., February 13, 1873.

SIR: I have the honor to inclose herewith a copy of a communication from the Acting Commissioner of Indian Affairs, dated the 10th instant, in relation to a deficiency in the appropriation for the subsistence of the Sioux Indians. The causes which have produced this deficiency are fully set forth in the Acting Commissioner's letter, and will be seen to have been beyond the control of the Department.

The condition of this appropriation was not brought to the attention of the Department until within a very short time, and it was supposed that if the appropriations for the fiscal year ending June 30, 1874, were made flexible, as had been done in former appropriation bills, the Indian Office would have been able to meet the demands upon that fund for the remainder of the fiscal year as well as for the next year, by the exercise of proper economy. The change in the appropriation bill, however, confining expenditures to the fiscal year for which it was made, has compelled the Department to ask for this deficiency. It seems to have been the custom of the Indian Office to supply deficiencies, where any occurred, by using the new appropriation so soon as it was made. For this reason this is the first time, within my knowledge of the affairs of the Department, when a deficiency has been asked for the support of Indian tribes.

The great importance of being able to feed this powerful nation of Sioux Indians, for the remainder of this fiscal year, must be apparent to every one, and needs only to be stated in order to be appreciated. Should the means to accomplish this object be withheld, there is great danger that the peaceable relations now existing between this nation and the United States will be disturbed; and should hostilities occur, aside from the ordinary calamities to individuals, the expense of such hostil-

ities to the Government will soon very far exceed the small amount now asked for, and which, if granted, it is believed will certainly prevent the occurrences to which I have alluded.

I desire, therefore, as earnestly as I may consistently with propriety, to urge upon the attention of Congress the request herein contained.

Very respectfully, your obedient servant,

C. DELANO,
Secretary.

Hon. JAMES G. BLAINE,
Speaker of the House of Representatives.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., February 10, 1873.

SIR: I have the honor to submit herewith a statement showing the appropriations and disbursements, in gross, that have been made annually for and on account of subsisting the Sioux Indians, under treaty made with that tribe April 29, 1868.

It will be seen from such statement that the entire amount appropriated has been expended, and that, consequently, there are no funds now at the disposal of the Department to purchase subsistence for said Indians for the remainder of the present fiscal year. The causes which have led to this deficiency, briefly stated, are as follows: It will be seen by the inclosed statement that in the first appropriation made for subsisting said Indians there was an actual deficiency of \$168,125.64, and in the second appropriation a further deficiency of \$57,531.45, making in all \$225,657.09. After deducting this amount of \$225,657.09 from the last appropriation, \$1,314,000, there was left for the present fiscal year only the sum of \$1,088,342.91. There has also been a large increase over last year in the number of Indians who are being fed at the Whetstone and Red Cloud agencies. The number fed during the last fiscal year at the Whetstone agency was never greater than about 5,000, while there are now not less than 10,000 being subsisted at that place. This increase is doubtless made up of individuals and bands that have been heretofore more or less with what are known as the "hostile Sioux." At the Red Cloud agency the number is also materially increased by reason of the northern Arapahoes and Cheyennes to the number of about 2,100 having come into that agency. The Yankton band of Sioux and the Poncas—neither of which tribes is a party to the Sioux treaty—have also been subsisted from the subsistence fund of the Sioux, as was contemplated by the Indian appropriation act of May 29, 1872.

There will be required for the subsistence of the Sioux, including the Yankton band and the Poncas, up to the 30th of June next, as near as the same can be estimated, not less than \$350,000; and as it cannot be expected that the contractors for furnishing supplies for these Indians should deliver any further stores without an assurance that they will receive pay for the same within a reasonable time, and as the only way to keep the Indians quiet and at their respective agencies is to feed them, which cannot be done unless an additional appropriation shall be made by Congress for that purpose, I have caused to be prepared, and inclose herewith, an estimate of a deficiency in the appropriation for the subsistence of the Sioux Indians until June 30, 1873, amounting to

\$350,000, and respectfully ask that the same be laid before Congress, with such favorable recommendation as the Department shall deem proper and advisable for the action of that body.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

Statement of appropriations and disbursements on account of the subsistence-fund for the Sioux Indians.

Periods for which appropriations and disbursements were made.	Appropriations and disbursements.	Deficiencies.
Amount appropriated for the year ended June 30, 1871..	\$985,500 00	.....
Amount disbursed	1,153,625 64	.....
		\$168,125 64
Amount appropriated for the year ended June 30, 1872..	1,314,000 00	.....
Amount disbursed	1,371,531 45	.....
		57,531 45
Amount appropriated for the year ending June 30, 1873..	1,314,000 00	.....
Amount disbursed	1,088,342 91	.....
		
Difference, being amount paid on account of the service for the years ended June 30, 1871 and 1872	225,657 09	.....
Total deficiencies .....	.....	225,657 09

OFFICE OF INDIAN AFFAIRS, January 18, 1873.

Estimate of appropriation required to meet a deficiency in the appropriation for the subsistence of the Sioux Indians for the fiscal year ending June 30, 1873.

For this amount, or so much thereof as may be necessary to make up deficiency in the appropriation for the fiscal year ending June 30, 1873, for the subsistence and support of "Sioux of different tribes, including Santee Sioux in the State of Nebraska, and Poncas in the great Sioux reservation, and families of Santee Dakota Sioux, who have taken homesteads at or near Flandreaw, in Dakota Territory" \$350,000 00

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APPROPRIATIONS FOR INDIAN SERVICE IN VARIOUS STATES.

LETTER

FROM THE

SECRETARY OF THE INTERIOR,

TRANSMITTING

An estimate of appropriations required for the incidental expenses of the Indian service, in various States and Territories, for the year ending June 30, 1873.

FEBRUARY 13, 1873.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., February 13, 1873.

SIR: I have the honor to transmit herewith a copy of a letter from the Acting Commissioner of Indian Affairs, dated the 12th instant, inclosing a special estimate for the sum of \$40,000, or so much thereof as may be necessary, to meet deficiencies in the appropriations for the fiscal year ending June 30, 1873, on account of the incidental expenses of the Indian service in California, Utah, Nevada, Dakota, and Montana.

The necessity for this appropriation, to enable the Department to meet contingencies that may arise in the Indian service in these States and Territories, is very urgent, and I earnestly recommend that the subject may receive the favorable action of Congress.

I have the honor to be your obedient servant,

C. DELANO,
Secretary.

Hon. JAS. G. BLAINE,
Speaker of the House of Representatives.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., February 12, 1873.

SIR: I have the honor to present herewith, for the favorable consideration of the Department, and of Congress, a special estimate for the sum of \$40,000, or so much thereof as may be necessary to meet deficien-

cies in the appropriations for the fiscal year ending June 30, 1873, on account of incidental expenses of the Indian service in California, Utah, Nevada, Dakota and Montana.

It is not possible to state the precise amount that will be required for the service in each of these States and Territories, dependent, as it is, upon contingencies that have to be provided for as they arise, but it is believed that the aggregate amount embraced in the inclosed estimate will prove a sufficiency.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

Estimate of appropriations required for the incidental expenses of the Indian service in various States and Territories for the year ending June 30, 1873.

For the following amounts, or so much thereof as may be necessary to meet deficiencies in the appropriations for the year ending June 30, 1873: for the general incidental expenses of the Indian service in California, \$10,000; in Utah, \$10,000; in Nevada, \$10,000; in Dakota, \$5,000; and in Montana, \$5,000; amounting in the aggregate to..... \$40,000 00

NEGROES OF THE CHICKASAW NATION.

L E T T E R

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

An act passed by the legislature of the Chickasaw Nation entitled "An act to adopt the negroes of the Chickasaw Nation," &c.

FEBRUARY 13, 1873.—Referred to the Committee on Freedmen's Affairs and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., February 10, 1873.

SIR: I have the honor to transmit herewith copy of a communication from the Acting Commissioner of Indian Affairs, dated the 4th instant, inclosing a communication to him from Douglas H. Cooper, of the Chickasaw Nation, dated the 23d ultimo, together with a letter addressed to the President of the United States, by Cyrus Harris, governor of said nation, dated the 10th ultimo, transmitting an act of the Chickasaw legislature providing for the adoption of negroes in the Chickasaw country, referred to in the third article of the treaty with the Choctaws and Chickasaws, concluded April 28, 1866. (Statutes at Large, vol. 10, p. 769.)

A careful examination of these communications exhibits the fact that the third article of the treaty referred to remains unexecuted. Neither the Choctaws nor Chickasaws have made such rules and regulations as were contemplated in said article in regard to persons of African descent residing in their respective nations, within two years after the ratification of the aforesaid treaty. The Choctaw Nation has never, at any time, attempted the execution of this treaty in regard to said persons, and what has been done by the Chickasaw Nation was done after the expiration of the two years in which their action was limited by the treaty aforesaid.

Deeming it important that the provisions of said treaty be carried out, I have respectfully to recommend that such legislation be had during the present session of Congress, if possible, as will extend the time in all respects for the execution of the provisions of the third article of the treaty before referred to, for the term of two years from the 1st day of July, 1873.

Very respectfully, your obedient servant,

C. DELANO,
Secretary.

Hon. JAS. G. BLAINE,
Speaker U. S. House of Representatives, Washington, D. C.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., February 4, 1873.

SIR: I have the honor to submit herewith a communication from Douglas H. Cooper, of the Chickasaw Nation, dated the 23d ultimo, together with a letter addressed to the President, by Cyrus Harris, governor of said nation, dated the 10th ultimo, transmitting an act of the Chickasaw legislature providing for the adoption of the negroes in the Chickasaw country, referred to in the third article of the treaty concluded with the Choctaw and Chickasaw Indians April 28, 1866. (Statutes at Large, vol. 14, p. 769.)

In view of the expiration of the term of two years from the ratification of the treaty, within which it is stipulated that the laws, rules, and regulations referred to in the third article of the treaty aforesaid, shall be made by the Choctaw and Chickasaw Nations, and believing it to be for the best interests of the Indians, as well as of the negroes, that the latter should remain where they now are, and that the money referred to in said article should be paid to said nations, I respectfully recommend that Congress be asked to provide by legislation that the limit to the time mentioned in said third article be extended three years from the 1st of July, 1873, or until July 2, 1876.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

WASHINGTON, D. C., *January 25, 1873.*

SIR: I have the honor herewith to hand you a letter from Cyrus Harris, governor of the Chickasaw Nation, dated at the executive office, Tishomingo, Chickasaw Nation, January 10, 1873, and directed to the President of the United States, inclosing an act of the legislature of the Chickasaw Nation, approved on the date of said letter, entitled "An act to adopt the negroes of the Chickasaw Nation," &c., and requesting "that the President will transmit the same to Congress for such action as that honorable body may deem proper;" and I respectfully request that you will transmit the said letter and act to the President, through the honorable Secretary of the Interior, at your earliest convenience.

I am, sir, your obedient servant,

DOUGLAS H. COOPER,
Of the Chickasaw Nation.

Hon. H. R. CLUM,
Acting Commissioner, Office of Indian Affairs, Department of the Interior.

EXECUTIVE OFFICE,
Tishomingo City, Chickasaw Nation, January 10, 1873.

SIR: I have the honor to inclose a copy of an act passed by the legislature of the Chickasaw Nation, and approved this day, entitled "An act to adopt the negroes of the Chickasaw Nation," &c., and respectfully request that you will transmit the same to the Congress of the United States for such action as that honorable body may deem proper at the earliest day possible.

I am, sir, your obedient servant,

CYRUS HARRIS,
Governor of the Chickasaw Nation of Indians.

The PRESIDENT of the United States,
Washington, D. C.

AN ACT to adopt the negroes of the Chickasaw Nation, &c.

SECTION 1. *Be it enacted by the legislature of the Chickasaw Nation*, That all the negroes belonging to Chickasaws at the time of the adoption of the treaty of Fort Smith, and living in the Chickasaw Nation at the date thereof, and their descendants, are hereby declared to be adopted in conformity with the third article of the treaty of 1866, between the Choctaws, Chickasaws, and the United States: *Provided, however*, That the proportional part of the \$300,000 specified in article third of the said treaty, with the accrued interest thereon, shall be paid to the Chickasaw Nation for its sole use and benefit: *And provided further*, The said adopted negroes of the Chickasaw Nation shall not participate in any part of the said proportional part of the said \$300,000, nor be entitled to any benefit from the principal and interest on our invested funds or claims arising therefrom, nor to any part of our common domain, or the profits arising therefrom, (except the forty acres per capita provided for in the third article of the treaty of 1866,) nor to any privileges or rights not authorized by treaty stipulations: *And provided further*, That the said adopted negroes, upon the approval of this act, shall be subject to the jurisdiction and laws of the Chickasaw Nation, and to trial and punishment for offenses against them in every case just as if the said negroes were Chickasaws.

SEC. 2. *And be it further enacted*, That this act shall be in full force and effect from and after its approval by the proper authority of the United States. And all laws, or parts of laws, in conflict with this act, are hereby repealed.

Approved January 10, 1873.

CYRUS HARRIS,
Governor.

Attest:

W. H. BOURLAND,
National Secretary, Chickasaw Nation.

I do hereby certify that the above copy is a true and authenticated copy from the original now on file in my office this January 10, 1873.

W. H. BOURLAND,
National Secretary, Chickasaw Nation.

○

RESTORATION TO MARKET OF CERTAIN LANDS IN
MICHIGAN.

L E T T E R

FROM THE

SECRETARY OF THE INTERIOR,

RELATIVE TO

The restoration to market of certain lands in Michigan.

FEBRUARY 13, 1873.—Referred to the Committee on Public Lands and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., February 10, 1873.

SIR: I have the honor to inclose a copy of a communication from the Acting Commissioner of Indian Affairs, dated the 6th instant, inviting my attention to the act of Congress approved June 10, 1872, entitled "An act for the restoration to market of certain lands in Michigan," which relates to lands which have been withheld from sale for the Ottawa and Chippewa Indians of Michigan, under the provisions of the treaty of July 31, 1855. (Stats., vol. 11, p. 612.)

The fourth section of this act provides "that all selections by Indians heretofore made, and regularly reported and recognized as valid and proper by the Secretary of the Interior and Commissioner of Indian Affairs, shall be patented to the respective Indians making the same; and all sales heretofore made and reported, where the same are regular and not in conflict with such selections, or with any other valid adverse right, except of the United States, are hereby confirmed, and patents shall issue thereon as in other cases according to law."

An examination of the facts shows that a large number of Indians are really entitled to make selections, in virtue of the spirit and intention of the said act, and had made their selections and received their certificates therefor and made valuable improvements upon their lands; but such selections had never been "reported and recognized as valid and proper by the Secretary of the Interior and Commissioner of Indian Affairs;" and, therefore, not having been so reported, are not such selections as are provided for in the act referred to.

I have the honor to recommend the passage of an act authorizing the issue of patents to these Indians, and herewith inclose a draught of a bill which, if passed, will secure the object sought.

Very respectfully, your obedient servant,

C. DELANO,
Secretary.

The Hon. SPEAKER of the House of Representatives.

2 RESTORATION TO MARKET OF CERTAIN LANDS IN MICHIGAN.

AN ACT to amend an act entitled "An act for the restoration to market of certain lands in Michigan," approved June tenth, one thousand eight hundred and seventy-two.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time for restoring to market the lands remaining undisposed of in the reservation made for the Ottawa and Chippewa Indians of Michigan, by the treaty of July thirty-first, eighteen hundred and fifty-five, be, and the same is hereby, extended until July tenth, eighteen hundred and seventy-three; and the Secretary of the Interior is hereby authorized and directed to cause selections of land to be made and patented prior to that date, to all Indians who were entitled under the provisions of the treaty of July thirty-first, one thousand eight hundred and fifty-five, aforesaid, who have not heretofore received the same, in quantity to each according to the provisions of said treaty.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., February 6, 1873.

SIR: I have the honor to invite your attention to the act of Congress approved June 10, 1872, entitled "An act for the restoration to market of certain lands in Michigan," which relates to lands which have been withheld from sale for the Ottawa and Chippewa Indians of Michigan, under the provisions of the treaty of July 31, 1855, (Stats. at Large, vol. 11, p. 621.)

By the terms of this treaty, lists, embracing the names of all persons entitled to selections of land under its provisions, were to be completed by the 1st day of July, 1856, and, during the next five years thereafter, the persons entitled were to make their selections of land, and, after the expiration of these five years, for a further term of five years, it was provided that the lands within the reservations provided for by the treaty, not previously appropriated or selected, should be subject to entry as other public lands "*by Indians only.*" The selections for Indians have never been completed under this treaty, it having been recently found that quite a number who have occupied and improved lands have been overlooked.

It appears from the records of the Mackinac agency that selections of land for these Indians, who have been overlooked, had been made by the United States agent, and certificates issued to them; these selections had, however, never been approved by the Secretary of the Interior or Commissioner of Indian Affairs.

If, in your opinion, the act of June 10, 1872, does not, at this date, authorize the issue of patents to these Indians, I respectfully recommend that Congress be requested to provide by legislation for an extension of the time for the restoration to market of the lands which have been withheld from sale under the treaty of 1855, and that selections of land and the issue of patents to all Indians entitled under the treaty of 1855 be provided for before the restoration of said land to market.

Very respectfully, your obedient servant,

H. R. CLUM,
Acting Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

ENLISTED MEN AND CIVILIANS EMPLOYED IN THE QUAR-
TERMASTER'S DEPARTMENT.

LETTER

FROM

THE SECRETARY OF WAR,

RELATIVE TO

*The enlisted men and civilians employed in the Quartermaster's Depart-
ment.*

FEBRUARY 13, 1873.—Referred to the Committee on Military Affairs and ordered to be
printed.

WAR DEPARTMENT,
February 11, 1873.

The Secretary of War has the honor to transmit to the House of Rep-
resentatives, for the information of the Committee on Military Affairs,
the inclosed statements of the enlisted men and civilians employed in
the Quartermaster's Department, as requested in letter of said committee
of the 1st instant, addressed to the Quartermaster-General.

WM. W. BELKNAP,
Secretary of War.

2 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of enlisted men employed on extra duty in the Quartermaster's Department, by what

Last month received.	Name of officer.	Post or station.
Dec., 1872	Aldrich, Lieutenant Bishop	Fort D. A. Russell, Wyo
July, 1872	Armstrong, Lieutenant R. G.	Fort Porter, N. Y.
Dec., 1872	Babcock, Major O. E.	Washington, D. C.
Dec., 1872	Eaton, Major J. H., paymaster	do
Dec., 1872	Townsend, Brigadier-General E. D.	do
Dec., 1872	Crane, Colonel C. H.	do
Dec., 1872	Eaton, Brigadier-General A. B.	do
Dec., 1872	Bates, Lieutenant R. F.	Chester, S. C.
Dec., 1872	Chamberlain, Lieutenant L. A.	Fort Pulaski, Ga.
Dec., 1872	Humphrey, Lieutenant C. F.	Point San José, Cal.
Dec., 1872	Ives, Lieutenant R. A.	Fort Preble, Maine
Dec., 1872	Shelby, Lieutenant I. O.	Jackson, Miss.
Dec., 1872	Marlin, Captain W. P.	Columbia, S. C.
Dec., 1872	McIntyre, Lieutenant A.	Chattanooga, Tenn.
Dec., 1872	Miller, Lieutenant James	Mobile, Ala.
Dec., 1872	Moore, Major T.	Fort Adams, R. I.
Dec., 1872	Richards, Lieutenant W. N.	Nashville, Tenn.
Dec., 1872	Rosencrantz, Lieutenant Fred.	Aberdeen, Miss.
Dec., 1872	Rutherford, Lieutenant R. E.	Fort Columbus, New York Harbor
Dec., 1872	Smith, Lieutenant Lewis	Fort Hamilton, New York Harbor
Dec., 1872	McCauley, Lieutenant C. A. H.	Fort Wadsworth, New York Harbor
Sept., 1872	Pope, Lieutenant John	Fort Wood, New York Harbor
Dec., 1872	Sellmer, Lieutenant Charles	David's Island, New York Harbor
Dec., 1872	Whitehead, Lieutenant F. F.	Yorkville, S. C.
Aug., 1872	Greene, Major O. D.	Saint Paul, Minn.
Dec., 1872	Hall, Lieutenant R. M.	Charleston, S. C.
Dec., 1872	Leefe, Lieutenant J. G.	Baton Rouge, La.
Dec., 1872	Lord, Lieutenant T. W.	Fort Snelling, Minn.
Dec., 1872	Sherman, Lieutenant James L.	Barrancas, Fla.
Nov., 1872	Scully, Captain J. W.	Fort Rice, Dak.
Dec., 1872	Whiall, Lieutenant S. R.	Humboldt, Miss.
Nov., 1872	Brinckle, Lieutenant J. R.	Fort Warren, Mass.
Sept., 1872	Deshler, Lieutenant G. W.	Fort Ontario, N. Y.
Dec., 1872	Drum, Colonel R. C.	Headquarters Department of the East
Dec., 1872	Duff, Lieutenant George	Fort Gratiot, Mich.
Dec., 1872	Hodges, Major H. C.	Atlanta, Ga.
Dec., 1872	Mackay, Lieutenant W. S.	Fort Lyon, Colo.
Dec., 1872	Wheeler, Lieutenant G. M.	Exploring party
Dec., 1872	Constable, Captain N. S.	Fort Concho, Texas
Nov., 1872	Green, Lieutenant A. P.	Fort Macon, N. C.
Dec., 1872	Sutherland, Lieutenant-Colonel C.	New York City
Dec., 1872	Veder, Lieutenant S. C.	Jackson Barracks, La.
Nov., 1872	Adams, Lieutenant J. Q.	Camp Warren, Oreg.
Dec., 1872	Clague, Lieutenant J. J.	Fort Yuma, Cal.
Dec., 1872	Clifford, Lieutenant John J.	Benicia Arsenal, Cal.
Dec., 1872	Rockwell, Lieutenant James	Benicia Barracks, Cal.
Dec., 1872	Dana, Major J. J.	Prescott, Ariz.
Nov., 1872	Dandy, Captain G. B.	Fort Abercrombie, Dak.
Oct., 1872	Dudley, Captain E. S.	Fort Cape Disappointment, Wyo.
Nov., 1872	Forsyth, Captain L. C.	Fort Ellis, Mont.
Nov., 1872	Harwood, Lieutenant Paul	Fort Pembina, Dak.
Nov., 1872	James, Captain H. W.	Vancouver Depot, W. T.
Dec., 1872	McCormick, Surgeon Charles	Department of California
Dec., 1872	Breck, Major Samuel	San Francisco, Cal.
Nov., 1872	McKeever, Major C.	New York City
Nov., 1872	Myers, Major F.	Santa Fé, N. Mex.
Dec., 1872	Robinson, Captain A. G.	Fort Sill, I. T.
Dec., 1872	McGonigle, Captain A. J.	Fort Union, N. Mex.
Nov., 1872	Strang, Captain E. J.	Brownsville, Texas
Nov., 1872	Upham, Lieutenant F. R.	Camp Apache, Ariz.
Nov., 1872	Winters, Lieutenant W. H.	Camp Bidwell, Cal.
Dec., 1872	Bacon, Lieutenant G. R.	Camp Halleck, Nev.
Dec., 1872	Custer, Lieutenant B. M.	Fort Duncan, Texas
Dec., 1872	Kimball, Lieutenant A. S.	Fort Reilly, Kansas
Oct., 1872	Badger, Lieutenant N. D.	Yellowstone Exploring Expedition
Dec., 1872	Barrett, Captain A.	Yerba, Cal.
Dec., 1872	Belger, Major James	Fort Brown, Texas
Dec., 1872	Clark, Lieutenant E. R.	Austin, Texas
Dec., 1872	Blunt, Captain A. P.	Fort Buford, W. T.
Dec., 1872	Craigie, Lieutenant D. J.	Angel Island, Cal.
Dec., 1872	Courtney, Lieutenant M. L.	Fort Stockton, Texas
Dec., 1872	Ebstein, Lieutenant H. E.	Camp San Juan, W. T.
Dec., 1872	Engle, Lieutenant J. B.	Fort Craig, N. Mex.
Dec., 1872	Dove, Lieutenant W. E.	Camp Independence, Cal.
Dec., 1872	Hart, Lieutenant D.	Fort Quitman, Texas
Dec., 1872	Howell, Captain W. T.	Fort Laramie, W. T.

* Pay Department, employed in.

† Adjutant-General's Office, employed in.

PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT. 3

officer reported, at what station or post, kind of duty on which engaged, and the monthly pay.

Clerks' monthly pay.		Mechanics' monthly pay.		Laborers' monthly pay.		Store-keepers' monthly pay.		Messengers' monthly pay.		Total monthly pay.	
No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
3	\$32 55	25	\$271 25	43	\$266 60					71	\$570 40
				1	6 20					1	6 20
3	32 55							7	\$43 40	10	75 95
1	10 85							4	24 80	5	*35 65
145	1,583 25							70	404 35	215	†1,987 60
179	1,941 95							34	210 80	213	‡2,152 75
				3	18 60					3	§18 60
		1	9 10	1	6 20	1	\$5 20			3	20 50
		2	18 20	4	15 60					6	33 80
		3	23 10	2	6 20					5	29 30
				1	6 20					1	6 20
		7	47 60	3	18 60					10	66 20
				1	6 20					1	6 20
		5	44 45	4	13 60					9	58 05
				5	31 00					5	31 00
1	10 85	9	77 69	18	91 40					28	179 94
		9	64 65	5	31 00					14	95 65
		1	9 10	3	15 60					4	24 70
1	10 85	11	89 25	17	85 80					29	185 90
		6	43 75	7	27 00					13	70 75
		3	27 30	3	18 60					6	45 90
2	19 25	2	17 50	9	54 00					13	90 75
		1	3 50	10	43 00					11	46 50
1	10 85	3	18 75	2	6 20					6	35 80
10	119 35									10	119 35
		3	21 35	1	6 00					4	27 35
1	10 85	3	31 85	23	132 00					27	174 70
		6	54 25	7	36 20					13	90 45
		3	22 75	4	18 00					7	40 75
1	10 85	20	175 35	23	119 60					44	305 80
1	10 85	2	18 20	1	6 20					4	35 25
				2	12 00					2	12 00
				1	6 00					1	6 00
10	108 50									10	108 50
				2	14 70					2	14 70
		1	10 85	6	34 20					7	45 05
		3	15 05	13	80 60	1	6 20			17	101 85
1	10 85									1	10 85
		21	207 20	17	88 00	1	10 85			39	306 05
		2	12 60	8	27 20					10	39 80
2	21 70									2	21 70
1	10 85	4	43 40	19	100 60					24	154 85
1	10 85	7	58 80	19	85 20					27	154 85
		2	21 70	2	12 40					4	34 10
				4	21 80					4	21 80
		5	45 50	10	59 00					15	104 50
1	10 85	28	303 80	1	6 20					30	320 85
		3	32 90	8	34 60					11	67 50
1	8 05	3	19 08	11	32 80					15	59 93
1	10 50	6	46 55	32	171 20					39	228 25
1	7 00	2	14 70	6	28 20					9	49 90
		1	10 50	2	12 00					3	22 50
3	32 55									3	32 55
10	108 50									10	108 50
10	105 00									10	105 00
				6	36 00					6	36 00
		6	28 00							6	28 00
1	10 85	13	96 60	15	71 60					29	179 05
		2	21 00	29	156 20					31	177 20
2	21 00	6	56 35	30	123 20					38	200 55
		4	42 00	6	34 00					10	76 00
				10	66 00					10	66 00
1	10 85	6	11 20	15	88 40					22	110 45
		23	180 25	9	53 60					32	233 85
1	6 30	2	12 25	6	16 20					9	34 75
1	5 60	1	10 85	11	36 40					13	52 85
		3	18 55	35	173 60					38	192 15
		1	10 85	2	12 40					3	23 25
		23	197 40	31	152 60	1	6 20			55	356 20
1	10 85	4	43 40	13	74 60					18	128 85
1	10 85	3	26 95	11	56 80					15	94 60
		3	32 55	3	18 60					6	51 15
		2	14 00	8	33 40					10	47 40
		5	50 75	12	60 40					17	111 15
1	6 20	1	7 00	4	24 80					6	38 00
2	21 70	27	260 05	30	176 80					59	458 55

† Surgeon-General's Office, employed in.

§ Commissary-General's Office, employed in.

4 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of enlisted men employed on extra duty

Last month received.	Name of officer.	Post or station.
Dec., 1872	Howard, Lieutenant O. H.	Fort Trumbull, Conn
Dec., 1872	Lord, Lieutenant J. H.	Fort McHenry, Md.
Oct., 1872	McDermott, Lieutenant G. B.	Camp Verde, Ariz
Dec., 1872	Jones, Lieutenant F. B.	Fort Hays, Kansas
Dec., 1872	Quimby, Lieutenant Ira	Fort Griffin, Texas
Dec., 1872	Rawalle, Lieutenant W. C.	Fort Saunders, W. T.
Dec., 1872	Rheem, Lieutenant E. B.	Fort Vancouver, W. T.
Dec., 1872	Shelton, Lieutenant E. H.	Fort Lapwai, I. T.
Oct., 1872	Slade, Lieutenant C. E.	Fort Stanton, N. Mex
Dec., 1872	Taylor, Lieutenant Frank	Fort Fetterman, W. T.
Dec., 1872	Thorn, Lieutenant P. M.	Fort Sully, Dak
Dec., 1872	Wherry, Captain W. M.	Headquarters Mil. Division of the Pacific
Dec., 1872	Sarson, Lieutenant H. B.	Huntsville, Ala
Nov., 1872	Godwin, Lieutenant E. A.	Fort Seldon, N. Mex.
Dec., 1872	Halloran, Lieutenant James	Camp Wright, Cal
Dec., 1872	Reynolds, Captain C. A.	Camp Supply, I. T.
Oct., 1872	Wood, Lieutenant O. E.	Fort Sullivan, Maine
Dec., 1872	Bascomb, Lieutenant G. M.	Fort Fred. Steele, Dak
Dec., 1872	Eastman, Lieutenant James E.	Fort Foote, Md
Dec., 1872	Guthrie, Lieutenant J. B.	Camp Brown, W. T.
Dec., 1872	Kelton, Lieutenant-Colonel J. C.	Headquarters Mil. Division of the Pacific
Dec., 1872	Kingsbury, Lieutenant H. P.	Fort Harker, Kansas
Dec., 1872	Kingsbury, Lieutenant G. W.	Camp Gaston, Cal.
Dec., 1872	Hamner, Lieutenant W. H.	Fort Reilly, Minn
Dec., 1872	McGilvray, Lieutenant John	Raleigh, N. C.
Oct., 1872	Lawton, Lieutenant H. W.	In the field, Tex
July, 1872	Cranston, Lieutenant J. R.	Brazos de Santiago, Tex
Dec., 1872	Allsworth, Lieutenant Edward	Fort Bliss, Tex
Dec., 1872	Kelton, Lieutenant D. H.	San Antonio, Tex
Nov., 1872	Kyle, Lieutenant W. J.	Fort Richardson, Tex
Nov., 1872	Markley, Lieutenant A. C.	Fort McIntosh, Tex
Dec., 1872	Gray, Lieutenant C. M.	Fort Davis, Tex
Dec., 1872	Barrett, Lieutenant G.	Fort McKevitt, Tex
Dec., 1872	Albee, Lieutenant J. E.	Ringgold Barracks, Tex
Dec., 1872	Rucker, Lieutenant L. H.	Fort Clark, Tex
Dec., 1872	Rogers, Lieutenant B. H.	Fort Bridger, W. T.
Nov., 1872	Chance, Lieutenant J. E.	Camp Douglass, W. T.
Nov., 1872	Hoag, Lieutenant W. B.	Fort Colvill, W. T.
Oct., 1872	Nose, Lieutenant W. P.	San José, Cal
Dec., 1872	Fuger, Lieutenant Fred	Alcatraz, Cal
Dec., 1872	Miller, Lieutenant C. P.	Presidio, Cal
Oct., 1872	Furey, Captain J. N.	Tucson, Ariz.
Nov., 1872	Rockwell, Lieutenant C. H.	Camp Grant, Ariz
Nov., 1872	Hurst, Lieutenant, J. H.	Camp Beales, Ariz
Nov., 1872	O'Connor, Lieutenant Stephen	Camp Crittenden, Ariz
Sept., 1872	Wesendorff, Lieutenant Max	Fort Wipple, Ariz
Nov., 1872	Thompson, Captain E. T.	Mohave, Ariz
Nov., 1872	Hay, Lieutenant Charles	Camp McDowell, Ariz
Oct., 1872	Bird, Lieutenant Charles	Camp Bowie, Ariz
Nov., 1872	Trout, Lieutenant J. T.	Camp Date Creek, Ariz
Dec., 1872	Broderick, Lieutenant P. T.	Hualpai, Ariz
Nov., 1872	Pollock, Lieutenant Robert	Fort Klamath, Oreg
Dec., 1872	Miller, Lieutenant M. P.	Fort Stevens, Oreg
Nov., 1872	Riley, Lieutenant T. F.	Camp Harney, Oreg
Dec., 1872	Spurgin, Lieutenant W. F.	Fort Boise, I. T.
Dec., 1872	King, Lieutenant J. S.	Fort Hall, I. T.
Dec., 1872	Wilson, Lieutenant D. B.	Fort Gibson, I. T.
Oct., 1872	Wishart, Lieutenant A.	Fort Cross, Dak
Dec., 1872	Campbell, Lieutenant W. J.	Fort Randall, Dak
Nov., 1872	Hawley, Lieutenant W.	Fort Wadsworth, Dak
Nov., 1872	Willey, Lieutenant T. M.	Fort McKeen, Dak
Dec., 1872	Roberts, Lieutenant C. J.	Cheyenne agency, Dak
Sept., 1872	Stafford, Lieutenant J. S.	Fort Ransom, Dak
Nov., 1872	Atwood, Lieutenant E. B.	Fort Stephenson, Dak
Nov., 1872	Morris, Lieutenant L. M.	Fort Totten, Dak
Dec., 1872	Troxel, Lieutenant T. G.	Grand River agency, Dak
Dec., 1872	Davis, Lieutenant T. F.	Lower Brulé agency, Dak
Dec., 1872	Clarke, Captain C. E.	Camp Hancock, Dak
Dec., 1872	McDougall, Lieutenant F. M.	Unionville, S. C.
Dec., 1872	Mathey, Lieutenant E. G.	Spartanburgh, S. C.
Dec., 1872	Miller, Lieutenant W. A.	Newberry, S. C.
Dec., 1872	Hyer, Lieutenant J. K.	Laurenceville, S. C.
Dec., 1872	Morton, Lieutenant A.	Omaha Barracks, Nebr
Nov., 1872	Capron, Lieutenant Thad. H.	Camp Vincent, Nebr
Dec., 1872	Rogers, Lieutenant W. W.	Sidney Barracks, Nebr
Nov., 1872	Schwatka, Lieutenant F.	North Platte, Nebr
Dec., 1872	Simpson, Lieutenant J. F.	Fort McPherson, Nebr

PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT. 5

in the Quartermaster's Department, &c.—Continued.

Clerks' monthly pay.		Mechanics' monthly pay.		Laborers' monthly pay.		Store-keepers' monthly pay.		Messengers' monthly pay.		Total monthly pay.	
No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
		3	\$19 95	6	\$30 60					9	\$50 55
		4	18 20	3	15 20					7	33 40
		3	32 55	4	21 20					7	53 75
		23	154 55	9	37 00					32	191 55
1	\$6 30	5	29 80	23	81 80					29	117 90
4	34 65	18	148 75	72	292 20					94	475 60
1	7 70	5	36 75	7	29 20					13	73 65
		2	15 30	6	40 10					8	55 40
1	4 90	6	28 35	25	121 05					32	154 30
4	39 20	5	39 55	22	91 00					31	169 75
1	10 85	9	83 65	30	173 60					40	268 10
10	105 00									10	105 00
		7	48 65	4	24 00					11	72 65
		4	36 40	12	61 40					16	100 80
		1	9 10	3	13 80					4	22 90
		9	78 40	13	75 40					22	153 80
				1	6 20					1	6 20
2	21 70	7	77 00	12	73 80					21	172 50
		1	4 90							1	4 90
		3	30 80	3	18 60					6	49 40
3	32 20									3	32 20
		1	3 50							1	3 50
		7	45 15	12	51 60					19	96 75
		4	36 40	10	60 00					14	96 40
1	10 85	5	39 90	18	77 60					24	128 35
1	10 85	2	10 50	23	112 60					26	133 95
				2	8 80					2	8 80
		1	9 45	6	31 60					7	41 05
		2	18 20	13	70 40					15	88 60
1	10 50	12	82 60	40	270 80					53	363 90
1	10 50			6	32 00					7	42 50
1	10 85	2	21 70	34	183 00					37	215 55
		9	72 80	19	102 40	2	\$11 20			30	186 40
		7	64 75	11	67 20					18	131 95
1	10 85	8	58 10	25	95 60					34	164 55
		6	55 65	6	33 20	1	10 85			13	99 70
1	10 50	9	91 35	34	185 40					44	287 25
		1	9 10	3	18 00					4	27 10
1	10 85	2	18 90	4	24 00					7	53 75
18	119 25	2	18 20	1	5 80					21	143 25
		6	50 40	14	76 20					20	126 60
				1	6 20	1	10 85			2	17 05
		6	61 60	12	69 20					18	130 80
1	10 50	8	78 05	9	55 00					18	143 55
		2	18 20	3	18 00					5	36 20
		1	8 75	6	36 00					7	44 75
1	10 50	3	25 90	7	38 20					11	74 60
		29	294 00	18	99 90					47	393 90
		4	42 70	3	18 60					7	61 30
1	10 50	3	28 00	15	69 00					19	107 50
		12	96 25	4	23 40					16	119 65
		4	40 95	11	61 40					15	102 35
				5	31 00					5	31 00
		11	93 10	25	97 00					36	190 10
		2	21 70	3	18 60					5	40 30
		1	9 10	5	30 00	1	10 85			7	49 95
		4	26 60	1	5 20					5	31 80
1	2 45	5	43 75	16	64 80					22	111 00
1	10 85	15	141 75	17	98 80					33	251 40
1	10 50	8	77 35	8	48 00					17	135 85
1	11 20	17	147 00	42	207 30					60	365 50
2	17 50	13	97 65	47	133 20					62	248 35
				3	18 00					3	18 00
		11	106 05	21	90 00					32	196 05
		10	89 00	21	99 00					31	188 00
1	10 85	3	28 35	23	107 40					27	146 60
		3	22 75	6	37 20	1	10 85			10	70 80
		3	9 45	6	11 20					9	20 65
		2	15 75	10	39 40					12	55 15
		6	45 50	3	18 60					9	64 10
				1	7 75					1	7 75
				2	12 40					2	12 40
1	10 85	6	56 35	31	157 80					38	225 00
1	5 60			5	15 80					6	21 40
1	10 85	10	74 90	13	72 40					24	158 15
		4	42 00	4	20 00					8	62 00
		7	33 60	11	67 20	1	10 85			19	111 65

6 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of enlisted men employed on extra duty

Last month received.	Name of officer.	Post or station.
Dec., 1872	Robinson, Lieutenant T. B.	Little Rock, Ark
Dec., 1872	Scott, Lieutenant John	Crab Orchard, Ky
Nov., 1872	Bubb, Lieutenant J. W.	Frankford, Ky
Nov., 1872	Conrad, Lieutenant C. H.	Newport Barracks, Ky
Dec., 1872	Ferris, Captain S. P.	Lebanon, Ky
Nov., 1872	Nowlan, Lieutenant H. J.	Louisville, Ky
Dec., 1872	Porter, Lieutenant J. E.	Shelbyville, Ky
Dec., 1872	Price, Lieutenant B.	Paducah, Ky
Nov., 1872	Smith, Lieutenant A. E.	Elizabethtown, Ky
Oct., 1872	Abbott, Lieutenant L. A.	Camp near Fort Hays, Kans
Dec., 1872	Hathaway, Lieutenant F. H.	Fort Leavenworth, Kans
Dec., 1872	Wallace, Lieutenant F. S.	Fort Wallace, Kans
Dec., 1872	Quimby, Lieutenant De H. G.	Fort Larned, Kans
Nov., 1872	Blair, Lieutenant Thomas	Fort Bayard, N. Mex
Nov., 1872	Brinkerhoff, Lieutenant H. R.	Fort Wingate, N. Mex
Nov., 1872	Buffum, Lieutenant M. P.	Tulwassa, N. Mex
Nov., 1872	Humphrey, Lieutenant H. H.	Fort Cummings, N. Mex
Nov., 1872	Farenswoth, Lieutenant H. J.	Fort McRae, N. Mex
Nov., 1872	Fountain, Lieutenant S. W.	Fort Wingate, N. Mex
Dec., 1872	Calhoun, Lieutenant James	Charlotte, N. C.
Dec., 1872	Curtis, Lieutenant E. S.	Fort Johnson, N. C.
Dec., 1872	Knox, Lieutenant Thomas C.	Camp McDermott, Nev
Dec., 1872	Sharp, Lieutenant Thomas	Fort McInac, Mich
Dec., 1872	Rogers, Lieutenant J. S.	Fort Wayne, Mich
Dec., 1872	Edmonds, Lieutenant F. H.	Fort Brady, Mich
Nov., 1872	Bradly, Lieutenant James H.	Fort Benton, Mont
Dec., 1872	Nelson, Lieutenant W. H.	Camp Baker, Mont
Nov., 1872	Sanno, Captain J. M.	Fort Shaw, Mont
Dec., 1872	Jackson, Lieutenant Henry	Office of Chief Signal-Officer
Nov., 1872	Dodge, Lieutenant H. C.	Sitka, Alaska
Oct., 1872	Hartz, Lieutenant W. T.	Fort Garland, Colo
Dec., 1872	Keefe, Lieutenant Joseph	Plattsburgh, N. Y.
Dec., 1872	Heintzelman, Lieutenant C. S.	Fort Niagara, N. Y.
Dec., 1872	Marshal, Lieutenant J. M.	West Point, N. Y.
Dec., 1872	O'Connell, Lieutenant J. J.	Madison Barracks, N. Y.
Dec., 1872	Krause, Lieutenant W.	Fort Dodge, Kans
July, 1872	Manley, Lieutenant J. A.	Fort Ripley, Minn
Dec., 1872	Sage, Lieutenant G. E.	Fort Independence, Md
Dec., 1872	Edgerly, Lieutenant W. S.	Opelika, Ala
Dec., 1872	Craigh, Lieutenant S.	Beaver, Utah
Dec., 1872	Drury, Lieutenant T. J.	Saint Augustine, Fla
Dec., 1872	Rusell, Lieutenant D. K.	Key West, Fla
Dec., 1872	Ingals, Lieutenant J. M.	Fort Jefferson, Fla
Dec., 1872	Olmstead, Lieutenant J. A.	Camp Stambaugh, W. T.
Nov., 1872	Bell, Lieutenant J. M.	Saint Louis, Mo
Dec., 1872	Dillanback, Lieutenant J. W.	Savannah, Ga
Dec., 1872	Eckerson, Captain T. J.	Fort Monroe, Va
Oct., 1872	Vernon, Lieutenant C. A.	In the field
Sept., 1872	Jacobs, Lieutenant J. W.	Northern Pacific Railroad survey

RECAPITULATION.

Number of enlisted men employed, 3,806; total monthly pay, \$26,731.86, or at the rate of \$320,782.32 per annum.

PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

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in the Quartermaster's Department, &c.—Continued.

Clerks' monthly pay.		Mechanics' monthly pay.		Laborers' monthly pay.		Store-keepers' monthly pay.		Messengers' monthly pay.		Total monthly pay.	
No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
				1	\$3 80					1	\$3 80
				1	4 00					1	4 00
		1	\$9 10	2	12 00					3	21 10
1	\$10 50	11	115 50	9	54 00					21	180 00
		1	5 60	3	9 60					4	15 20
1	10 50	8	75 60	6	36 00					15	122 10
				1	6 00					1	6 00
		1	10 85	2	12 40					3	23 25
		3	31 50	2	12 00					5	43 50
		4	27 30	21	70 20					25	97 50
2	19 95	8	68 25	35	172 00					45	260 20
		2	18 20	11	68 20					13	86 40
		10	81 90	5	25 60					15	107 50
		10	83 65	17	83 20					27	166 85
2	10 50	14	41 75	22	55 80					38	108 05
		4	38 85	20	96 90					24	135 75
		1	9 10	4	24 00					5	33 10
		2	14 70	5	25 40					7	40 10
3	10 50	19	75 90	28	72 60					50	159 00
		3	25 10	7	38 60					10	63 70
		4	84 65	2	12 40					6	47 05
		2	21 70	5	28 40					7	50 10
		1	10 85	3	18 60					4	29 45
		2	18 20	3	18 60					5	36 80
		2	21 70	2	6 20					4	27 90
		5	29 05	9	36 40					14	65 45
		5	54 25	8	49 60	1	\$10 85			14	114 70
		11	96 60	31	141 90	1	10 50			43	249 00
225	2,001 67									225	*2,001 67
1	5 20	7	45 15	3	18 00	1	10 50			12	78 85
2	12 90	6	46 98	12	63 50					20	123 38
		1	9 10	2	12 40					3	21 50
				2	8 00	1	7 00			3	15 00
11	109 35	17	144 45	59	345 86	1	10 85			88	610 45
		4	33 95	6	29 20					10	63 15
		11	46 20	10	53 20					21	99 40
		2	15 40	10	55 00					12	70 40
		1	10 85	2	12 40					3	23 25
				1	6 20					1	6 20
		6	65 10	17	102 60					23	167 70
		2	9 80	5	23 00					7	32 80
		3	34 30	3	22 00					6	56 30
		2	20 65	2	12 40					4	33 05
1	10 85			3	18 60					4	29 45
		36	285 25	22	112 20					58	397 45
		3	23 45	2	9 40					5	32 85
2	21 70	11	81 54	5	31 00					18	134 24
		3	32 55	3	18 60					6	51 15
		1	8 75	6	33 00					7	41 75
719	7,167 52	912	8,460 29	2,044	10,277 10	16	143 60	115	683 35	3,806	26,731 86

* Employed as clerks and messengers in Signal Service United States Army.

8 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of civilians employed in the Quartermaster's Department, by what officer

Last month received.	Name of officer.	Post or station.	MONTHLY PAY.					
			Clerks.		Agents and super-intendents.		Laborers.	
			Number.	Amount.	Number.	Amount.	Number.	Amount.
Dec., 1872	Robert Allen, Col., A. Q. M. G.	Washington, D. C.	3	\$435 00			2	\$120 00
Dec., 1872	J. D. Bingham, Maj., Q. M.	do	1	150 00			12	720 00
Dec., 1872	M. I. Ludington, Maj., Q. M.	do	24	3,309 98			1	60 00
Dec., 1872	William Myers, Capt., A. Q. M.	do	10	1,325 00	6	\$710 00	36	1,499 50
Dec., 1872	do	do	*25	2,499 97				
Dec., 1872	J. G. C. Lee, Maj., Q. M.	do	1	150 00				
Dec., 1872	B. Aldrich, Lt., A. A. Q. M.	Fort D. A. Russell, Wyo.	1	125 00	1	100 00	1	100 00
Nov., 1872	J. G. Chandler, Maj., Q. M.	Fort Leavenworth, Kans.	11	1,250 00	4	360 00	150	5,077 00
Dec., 1872	F. H. Hadaway, Lt., A. A. Q. M.	do	1	125 00				
Dec., 1872	L. A. Chamberlain, Lt., A. A. Q. M.	Fort Pulaski, Ga.						
Nov., 1872	C. F. Humphrey, Lt., A. A. Q. M.	Fort Johnston, N. C.					7	203 00
Dec., 1872	Hamilton Lieber, Capt., M. S. K.	Fort Snelling, Minn.	1	100 00			1	50 00
Aug., 1872	Ira McNutt, Lt., A. A. Q. M.	Barrancas, Fla.					1	35 00
Dec., 1872	W. P. Martin, Capt., M. S. K.	Columbia, S. C.	1	125 00				
Dec., 1872	A. McIntyre, Lt., A. A. Q. M.	Chattanooga, Tenn.					6	195 00
Dec., 1872	James Miller, Lt., A. A. Q. M.	Mobile, Ala.					19	598 75
Dec., 1872	T. Moore, Maj., Q. M.	Fort Adams, R. I.	1	150 00			2	100 00
Dec., 1872	W. V. Richards, Lt., A. A. Q. M.	Nashville, Tenn.					16	365 75
Dec., 1872	V. P. Van Antwerp, Capt., M. S. K.	Baltimore, Md.	1	125 00			1	35 00
Dec., 1872	George H. Weeks, Capt., A. Q. M.	Buffalo, N. Y.	2	225 00				
Dec., 1872	James Gilliss, Capt., A. Q. M.	Chicago, Ill.	4	540 00	1	125 00	3	175 00
Dec., 1872	D. H. Rucker, Col., A. Q. M. G.	do	4	540 00				
Dec., 1872	S. B. Holabird, Lt.-Col., D. Q. M. G.	San Antonio, Tex.	5	570 00	4	450 00	21	678 00
Dec., 1872	J. G. Leefe, Lt., A. A. Q. M.	Baton Rouge, La.					9	245 32
Dec., 1872	John Tyler, Lt., A. A. Q. M.	Fort Porter, N. Y.			1	12 50		
Nov., 1872	J. W. Scully, Capt., A. Q. M.	Fort Rice, Dak.	2	200 00				
Dec., 1872	I. O. Shelby, Lt., A. A. Q. M.	Vicksburgh and Natchez, Miss.					23	705 47
Nov., 1872	C. A. Alligood, Capt., M. S. K.	Schuylkill Arsenal, Philadelphia, Pa.	12	1,285 00	3	408 33	108	5,739 17
Dec., 1872	Langdon C. Easton, Col., A. Q. M. G.	Philadelphia, Pa.	9	1,155 00			2	120 00
Dec., 1872	C. G. Sawtelle, Maj., Q. M.	do	6	775 00	1	150 00	6	275 33
Nov., 1872	G. W. Bradley, Capt., A. Q. M.	Charleston, S. C.	4	475 00	1	75 00	10	330 00
Sept., 1872	George W. Deshler, Lt., A. A. Q. M.	Fort Ontario, N. Y.			1	13 33		
Dec., 1872	H. C. Hodges, Maj., Q. M.	Atlanta, Ga.	1	150 00			6	150 00
Dec., 1872	W. S. MacKay, Lt., A. A. Q. M.	Fort Lyon, Colo.	1	125 00			1	71 50
Dec., 1872	L. H. Rucker, Lt., A. A. Q. M.	Fort Clark, Tex.	1	125 00				

* Employed in the office

PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

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reported, at what station or post, kind of duty on which engaged, and the monthly pay.

MONTHLY PAY.															
Mechanics.		Teamsters.		Messengers.		Guides and scouts.		Mail-carriers.		Farmers on Gov- ernment farms.		Wagon and forage masters, United States Army.		Total.	
Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
														5	\$555 00
				1	\$60 00									14	930 00
5	\$693 20			7	390 00									37	4,453 18
16	1,660 50	6	\$260 00	2	120 00									76	5,575 00
														25	2,499 97
														1	150 00
1	100 00													4	425 00
45	2,530 00	28	840 00	2	75 00					47	\$891 60	1	\$67 00	288	11,090 60
1	71 50													2	196 50
1	125 00													1	125 00
1	35 00													8	238 00
														2	150 00
														1	35 00
														1	125 00
1	17 75													7	212 75
														19	598 75
1	100 00													3	250 00
														17	465 75
														2	160 00
				1	45 00									3	270 00
2	151 51			1	50 00									11	1,041 51
				1	50 00									5	590 00
24	1,722 00	117	3,780 14	1	35 00									172	7,235 14
3	140 00													12	385 32
4	111 00													5	123 50
2	175 00	1	30 00											5	405 00
1	310 00													24	1,015 47
27	3,255 00	2	108 00	1	60 00									163	10,855 50
1	100 00			1	75 00									13	1,450 00
		1	54 00	2	108 00									16	1,362 33
5	116 75	1	35 00	1	40 00									22	1,071 75
1	30 50													2	43 83
1	60 00													8	360 00
5	366 75													7	563 25
6	405 00													7	530 00

of the Adjutant-General.

10 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of civilians employed in the Quartermaster's

Last month received.	Name of officer.	Post or station.	MONTHLY PAY.					
			Clerks.		Agents and superintendents.		Laborers.	
			Number.	Amount.	Number.	Amount.	Number.	Amount.
Dec., 1872	F. L. Davies, Lt., A. A. Q. M.	Lower Brulé agency, Dak.	.....	.....	.....	.....	.....	.....
Dec., 1872	N. S. Constable, Capt., A. Q. M.	Fort Concha, Tex.....	1	\$125 00	.....	.....	1	\$75 00
Oct., 1872	Rufus Ingalls, Col., A. Q. M. G.	New York City.....	9	1,160 00	2	\$150 00	14	684 00
Dec., 1872	R. N. Batchelder, Maj., Q. M.	do.....	2	275 00	.....	.....	.....	.....
Dec., 1872	S. C. Vedder, Lt., A. A. Q. M.	Post of Jackson Barracks, La.	.....	.....	.....	.....	4	200 00
Oct., 1872	J. Q. Adams, Lt., A. A. Q. M.	Camp Warner, Oreg..	.....	.....	.....	.....	2	115 00
Dec., 1872	T. J. Eckerson, Capt., A. Q. M.	Fort Monroe, Va.....	2	166 60	.....	.....	1	20 00
Dec., 1872	J. A. Ekin, Lt.-Col., D. Q. M. G.	Jeffersonville, Ind....	26	2,982 50	8	985 00	122	4,949 03
July, 1872	H. E. Cavanaugh, Lt., A. A. Q. M.	Camp Douglass, W. T.	1	125 00	.....	.....	.....	.....
Nov., 1872	J. J. Dana, Maj., Q. M....	Prescott, Ariz.....	2	340 50	2	380 00	4	275 00
Nov., 1872	George B. Dandy, Capt., A. Q. M.	Fort Abercrombie, Depot, Dak.	1	125 00	1	125 00	5	235 00
Oct., 1872	E. S. Dudley, Lt., A. A. Q. M.	Cape Disappointment, W. T.	.....	.....	.....	.....	21	701 39
Dec., 1872	E. B. Grimes, Capt., A. Q. M.	Saint Louis, Mo.....	6	775 00	1	150 00	2	120 00
Dec., 1872	James M. Bell, Lt., A. A. Q. M.	Saint Louis Depot, Mo	.....	.....	.....	.....	.....	.....
Nov., 1872	L. Cass Forsyth, Capt., A. Q. M.	Fort Ellis, Mont	1	125 00	.....	.....	1	50 00
Dec., 1872	C. W. Foster, Capt., A. A. Q. M.	Sioux City, Iowa.....	1	125 00	.....	.....	5	145 75
Nov., 1872	Paul Howard, Lt., A. A. Q. M.	Pembina, Dak.....	.....	.....	.....	.....	.....	.....
Dec., 1872	A. J. McGonigle, Capt., A. Q. M.	Fort Union, N. Mex..	1	100 00	.....	.....	.....	.....
Dec., 1872	H. W. Janes, Capt., A. Q. M.	Vancouver Depot, W. T.	1	169 01	.....	.....	6	272 63
Dec., 1872	E. B. Rheem, Lt., A. A. Q. M.	do.....	.....	.....	.....	.....	.....	.....
Dec., 1872	A. Montgomery, Maj., Q. M.	Boston, Mass.....	2	260 00	.....	.....	.....	.....
Dec., 1872	James M. Moore, Maj., Q. M.	Cheyenne Depot, Wyo.	5	625 00	3	796 00	35	1,233 63
Nov., 1872	F. Myers, Lt.-Col., D. Q. M. G.	Santa Fé, N. Mex	7	732 50	.....	.....	26	310 00
Dec., 1872	H. E. Robinson, Capt., A. Q. M.	Fort Sill, L T	4	450 00	1	125 00	77	2,391 00
Dec., 1872	A. Barrett, Capt., M. S. K.	San Francisco Depot, Yerba Buena Isl'd, Cal.	2	250 00	1	100 00	5	390 00
Dec., 1872	D. G. Craigie, Lt., A. A. Q. M.	Angel Island, Cal .....	.....	.....	.....	.....	.....	.....
Dec., 1872	W. E. Dove, Lt., A. A. Q. M.	Camp Independence, Cal.	.....	.....	.....	.....	1	75 00
Nov., 1872	A. R. Eddy, Lt.-Col., D. Q. M. G.	San Francisco, Cal...	5	700 00	.....	.....	.....	.....
Nov., 1872	G. C. Smith, Capt., A. Q. M.	do.....	5	675 00	2	145 83	2	150 00
Aug., 1872	J. C. Kelton, Lieutenant-Colonel.	do.....	2	300 00	.....	.....	.....	.....
Dec., 1872	C. B. Miller, Lt., A. A. Q. M.	Presidio of San Francisco, Cal.	.....	.....	.....	.....	.....	.....
Dec., 1872	James Belger, Maj., Q. M.	Fort Brown, Tex.....	3	325 00	.....	.....	4	80 00
Dec., 1872	A. P. Blunt, Capt., A. Q. M.	Fort Buford, Dak	1	125 00	.....	.....	3	120 00
Dec., 1872	R. E. Clark, Lt., A. A. Q. M.	Austin, Tex .....	.....	.....	.....	.....	.....	.....

PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT. 11

Department, by what officer reported, &c.—Continued.

[illegible]

12 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of civilians employed in the Quartermaster's

Last month received.	Name of officer.	Post or station.	MONTHLY PAY.					
			Clerks.		Agents and super-intendents.		Laborers.	
			Number.	Amount.	Number.	Amount.	Number.	Amount.
Dec., 1872	M. L. Courtney, Lt., A. A. Q. M.	Fort Stockton, Tex...	1	\$100 00				
Dec., 1872	J. A. Potter, Maj., Q. M.	Detroit, Mich	3	400 00			2	\$50 75
Dec., 1872	H. C. Ransom, Maj., Q. M.	Saint Paul, Minn.....	6	750 00	1	\$145 00	5	199 00
Dec., 1872	E. J. Strong, Capt., A. Q. M.	Brownsville, Tex.....	1	125 00				
Nov., 1872	F. K. Upham, Lt., A. A. Q. M.	Camp Apache, Ariz...					1	70 00
Dec., 1872	George R. Bacon, Lt., A. A. Q. M.	Camp Halleck, Nev...						
Nov., 1872	W. H. Winters, Lt., A. A. Q. M.	Camp Bidwell, Cal...						
Dec., 1872	R. M. Custer, Lt., A. A. Q. M.	Fort Duncan, Tex....	1	125 00				
Dec., 1872	A. S. Kimball, Capt., A. Q. M.	Fort Riley, Kans.....	2	200 00				
Oct., 1872	N. D. Badger, Lt., A. A. Q. M.	Yellowstone Expedition.						
Dec., 1872	Ira Quimby, Lt., A. A. Q. M.	Fort Griffin, Tex....	1	125 00				
Oct., 1872	George B. McDermott, Lt., A. A. Q. M.	Camp Verde, Ariz....						
Dec., 1872	E. L. Randall, Lt., A. A. Q. M.	Fort Larned, Kans...	1	83 33				
Oct., 1872	W. R. Parnell, Lt., A. A. Q. M.	Fort Harney, Oreg...						
Dec., 1872	W. C. Rawalle, Lt., A. A. Q. M.	Fort Sanders, Wyo...	1	125 00				
Sept., 1872	W. B. Hughes, Capt., A. Q. M.	New Orleans, La.....	9	1,126 67	2	150 00	8	360 00
Oct., 1872	W. J. Ross, Lt., A. A. Q. M.	In the field with General Crooke.	1	150 00			33	2,028 00
Oct., 1872	E. Hunter, Lt., A. A. Q. M.	Benicia Barracks, Cal.					2	14 95
Nov., 1872	E. F. Thompson, Capt., A. Q. M.	Camp Mohave, Ariz...					3	117 00
Dec., 1872	F. H. E. Ebstine, Lt., A. A. Q. M.	Camp San Juan Isl'd, W. T.						
July, 1872	N. D. A. Sawyer, Capt., M. S. K.	Victoria, Tex	2	275 00			3	99 99
Dec., 1872	W. A. Elderkin, Capt., A. Q. M.	Puebla, Colo	2	225 00	2	80 00	11	321 50
Nov., 1872	J. B. Engle, Lt., A. A. Q. M.	Fort Craig, N. Mex...						
Nov., 1872	Daniel Hart, Lt., A. A. Q. M.	Fort Quitman, Tex...	1	25 00				
Dec., 1872	E. K. Russell, Lt., A. A. Q. M.	Key West, Fla.....						
Dec., 1872	W. T. Howell, Capt., A. Q. M.	Fort Laramie, W. T...	3	350 00				
Oct., 1872	E. H. Shelton, Lt., A. A. Q. M.	Fort Lapwai, I. T...					1	28 16
Oct., 1872	C. E. Slade, Lt., A. A. Q. M.	Fort Stanton, N. Mex.						
Dec., 1872	C. A. Reynolds, Capt., A. Q. M.	Camp Supply, I. T...	4	300 00				
Dec., 1872	Frank Taylor, Lt., A. A. Q. M.	Fort Fetterman, Wyo	1	125 00				
Dec., 1872	P. T. Broderick, Lt., A. A. Q. M.	Camp Hualpia, Ariz...						
Dec., 1872	J. A. Olmstead, Lt., A. A. Q. M.	Camp Stambaugh, W. T.						
Dec., 1872	P. M. Thorne, Lt., A. A. Q. M.	Fort Sully, Dak.....						
Oct., 1872	O. E. Wood, Lt., A. A. Q. M.	Fort Sullivan, Me....						

PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT. 13

Department, by what officer reported, &c.—Continued.

[illegible]

14 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of civilians employed in the Quartermaster's

Last month received.	Name of officer.	Post or station.	MONTHLY PAY.					
			Clerks.		Agents and super-intendents.		Laborers.	
			Number.	Amount.	Number.	Amount.	Number.	Amount.
Dec., 1872	G. M. Bascom, Lt., A. A. Q. M.	Fort Fred Steele, W. T.	1	\$125 00				
Dec., 1872	J. H. Belger, Capt., A. Q. M.	Omaha, Nebr.	4	525 00	5	\$600 00	50	\$1,947 00
Dec., 1872	Alfred Morton, Lt., A. A. Q. M.	Omaha Barr'ks, Nebr.	1	125 00				
Aug., 1872	George B. Davis, Lt., A. A. Q. M.	Camp Bowie, Ariz ...						
Dec., 1872	J. B. Guthrie, Lt., A. A. Q. M.	Camp Brown, W. T. ..						
Oct., 1872	John M. Coe, Capt., A. Q. M.	Fort Totten, Dak						
Nov., 1872	E. A. Goodwin, Lt., A. A. Q. M.	Fort Selden, N. Mex. .						
Dec., 1872	H. B. Kingsbury, Lt., A. A. Q. M.	Fort Harker, Kans. . .	1	125 00				
Dec., 1872	G. W. Kingsbury, Lt., A. A. Q. M.	Fort Gaston, Cal.					1	67 42
Nov., 1872	E. B. Kirk, Lt., A. A. Q. M.	Fort Dodge, Kans.	2	195 83				
Oct., 1872	H. W. Lawton, Lt., A. A. Q. M.	In the field, Tex.						
July, 1872	H. B. Quimby, Lt., A. A. Q. M.	Fort Davis, Tex.	1	125 00				
Dec., 1872	D. B. Robinson, Lt., A. A. Q. M.	Little Rock, Ark.					1	24 00
Dec., 1872	J. C. McGilory, Lt., A. A. Q. M.	Post of Raleigh, N. C. .					4	39 46
Dec., 1872	W. G. Williams, Lt., A. A. Q. M.	Holly Springs and Corinth, Miss.	1	21 00			4	42 00
Oct., 1872	L. A. Abbott, Lt., A. A. Q. M.	Camp near Fort Hayes, Kans.						
Dec., 1872	B. H. Rogers, Lt., A. A. Q. M.	Fort Bridger, W. T. ..	2	210 00				
Dec., 1872	P. B. Barnard, Lt., A. A. Q. M.	Ehrenberg, Ariz.					1	50 00
July, 1872	W. J. Vose, Lt., A. A. Q. M.	Point San José, Cal. . .						
Nov., 1872	E. H. Blair, Lt., A. A. Q. M.	Fort Bayard, N. Mex. .					1	18 00
Dec., 1872	W. J. Campbell, Lt., A. A. Q. M.	Fort Randall, Dak.					1	50 00
Aug., 1872	C. L. Davis, Lt., A. A. Q. M.	Ringgold Barracks, Tex.	1	125 00				
Nov., 1872	William Hawley, Lt., A. A. Q. M.	Fort Wadsworth, Dak. .						
Dec., 1872	T. T. Knox, Lt., A. A. Q. M.	Camp McDermott, Nev. .						
Oct., 1872	John V. Fury, Capt., A. A. Q. M.	Tucson Depot, Ariz. . .	1	150 00	1	140 00	4	155 98
Dec., 1872	J. H. Rollins, Capt., A. A. Q. M.	Augusta Arsenal, Ga. .	1	36 00				
Nov., 1872	Robert Pollock, Lt., A. A. Q. M.	Fort Klamath, Oreg. . .					5	24 50
July, 1872	George Shorkly, Lt., A. A. Q. M.	Fort McRae, N. Mex. . .						
Nov., 1872	C. H. Rockwell, Lt., A. A. Q. M.	Camp Grant, Ariz.						
Dec., 1872	Ed. Allsworth, Lt., A. A. Q. M.	Fort Bliss, Tex.	1	125 00				
Sept., 1872	W. F. Spurgin, Lt., A. A. Q. M.	Fort Boise, Idaho.						
Dec., 1872	E. D. Baker, Capt., A. A. Q. M.	Ogden, Utah.	1	150 00	1	100 00		
Oct., 1872	Alex. Wishart, Lt., A. A. Q. M.	Fort Cross, Dak.						

16 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of civilians employed in the Quartermaster's

Last month received.	Name of officer.	Post or station.	MONTHLY PAY.					
			Clerks.		Agents and super-intendents.		Laborers.	
			Number.	Amount.	Number.	Amount.	Number.	Amount.
Dec., 1872	J. S. King, Lt., A. A. Q. M.	Fort Hall, Idaho						
Nov., 1872	H. R. Brinkerhoff, Lt., A. A. Q. M.	Fort Wingate, N. Mex	1	\$50 00	1	\$49 92	23	\$157 83
Nov., 1872	M. P. Buffum, Lt., A. A. Q. M.	Fort Delorosa, N. Mex					1	71 50
Nov., 1872	T. H. Capron, Lt., A. A. Q. M.	Camp Vincent, Nebr.						
Nov., 1872	H. C. Dodge, Lt., A. A. Q. M.	Sitka, Alaska						
Oct., 1872	W. T. Hartz, Lt., A. A. Q. M.	Fort Garland, Colo...						
Dec., 1872	S. P. Ferris, Capt., A. Q. M.	Post of Lebanon, Ky.					3	90 00
Aug., 1872	J. W. Hannay, Lt., A. A. Q. M.	Fort Reynolds, Colo..	1	100 00			2	50 00
Nov., 1872	J. H. Hurst, Lt., A. A. Q. M.	Camp Beal's Springs, Ariz.	3	260 00				
Nov., 1872	William Krause, Lt., A. A. Q. M.	Fort Dodge, Kans....					7	165 83
Nov., 1872	A. C. Markley, Lt., A. A. Q. M.	Fort McIntosh, Tex..	1	100 00				
Nov., 1872	W. J. Kyle, Lt., A. A. Q. M.	Fort Richardson, Tex.	1	125 00				
Nov., 1872	H. C. Nowlan, Lt., A. A. Q. M.	Louisville, Ky					1	12 00
Aug., 1872	H. B. Osgood, Lt., A. A. Q. M.	Fort Jefferson, Fla...						
Dec., 1872	H. C. Roberts, Lt., A. A. Q. M.	Cheyenne agency, Dak.						
Dec., 1872	W. Rogers, Lt., A. A. Q. M.	Sidney Barr'ks, Nebr.	1	125 00				
July, 1872	William P. Rogers, Lt., A. A. Q. M.	With detachment, en route.						
Dec., 1872	G. S. Rogers, Lt., A. A. Q. M.	Fort Wayne, Mich ...						
Nov., 1872	Thomas M. Willey, Lt., A. A. Q. M.	Fort McKeene, Dak..	2	200 00				
Sept., 1872	John A. Worden, Lt., A. A. Q. M.	Madison Barracks, N. Y.						
Dec., 1872	Thomas S. Wallace, Lt., A. A. Q. M.	Fort Wallace, Kan ...	1	125 00				
Dec., 1872	T. B. Wilson, Lt., A. A. Q. M.	Fort Gibson, I. T.....	1	125 00	1	75 00	6	186 35
Nov., 1872	E. B. Attwood, Lt., A. A. Q. M.	Fort Stevenson, Dak.						
Dec., 1872	J. F. Simpson, Lt., A. A. Q. M.	Fort McPherson, Nebr	2	210 00			2	35 00
Dec., 1872	J. W. Pullman, Lt., A. A. Q. M.	Tierra Amorilla, N. Mex.						
Aug., 1872	J. S. Stafford, Lt., A. A. Q. M.	Fort Ransom, Dak ...						
Nov., 1872	Fred. Schwatka, Lt., A. A. Q. M.	North Platte, Nebr...						
Dec., 1872	W. H. Nelson, Lt., A. A. Q. M.	Camp Baker, Mont...						
Dec., 1872	Rufus Saxton, Lt.-Col., D. Q. M. G.	Portland, Oreg	3	467 59	5	190 24	2	152 10
Dec., 1872	G. H. A. Dimpfel, Capt., M. S. K.	Benicia, Cal	1	150 00				
Dec., 1872	De H. G. Quimby, Lt., A. A. Q. M.	Fort Larned, Kans ...	1	125 00				
Sept., 1872	George F. Price, Lt., A. A. Q. M.	Camp McDowell, Ariz						
Dec., 1872	D. M. Willey, Lt., A. A. Q. M.	Fort Abe Lincoln, Dak.	1	100 00				

PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT. 17

Department, by what officer reported, &c.—Continued.

MONTHLY PAY.															
Mechanics.		Teamsters.		Messengers.		Guides and scouts.		Mail-carriers.		Farmers on Gov- ernment farms.		Wagon and forage masters, United States Army.		Total.	
Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
						1	\$13 00							1	\$13 00
8	\$203 05	12	\$176 91											45	637 71
2	98 30					1	90 00							4	259 80
		11	168 94											11	168 94
						1	34 09							1	34 09
10	308 87													10	308 87
														3	90 00
														3	150 00
						1	125 00							4	385 00
8	485 00	7	179 00											22	829 83
3	93 75	7	75 00			2	24 83							13	293 58
6	385 00					1	75 00							8	585 00
														1	12 00
2	265 00													2	265 00
5	305 00													5	305 00
3	321 00													4	446 00
						1	21 00							1	21 00
1	70 00													1	70 00
20	792 50													22	992 50
5	133 10													5	133 10
10	605 00													11	730 00
7	497 75	25	553 37											40	1,437 47
2	175 00					1	100 00	1	\$175 00					4	450 00
7	526 25	17	587 66			2	200 00							30	1,558 91
		8	26 64											8	26 64
1	75 00													1	75 00
2	165 00													2	165 00
4	438 33													4	438 33
				1	\$67 60									11	877 53
														1	150 00
1	71 50	3	90 00											5	286 50
						2	150 00							2	150 00
17	1,465 83	17	530 00			1	100 00							36	2,195 83

18 PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT.

Statement of civilians employed in the Quartermaster's

Last month received.	Name of officer.	Post or station.	MONTHLY PAY.					
			Clerks.		Agents and super-intendents.		Laborers.	
			Number.	Amount.	Number.	Amount.	Number.	Amount.
Nov., 1872	H. H. Humphrey, Lt., A. A. Q. M.	Fort Cummings, N. Mex.	.....	.....	.....	.....	.....	.....
Nov., 1872	J. M. J. Sanno, Capt., A. Q. M.	Fort Shaw, Mont.....	1	\$125 00	.....	.....	.....	.....
Dec., 1872	G. Barrett, Lt., A. A. Q. M.	Fort McKavett, Tex.	1	125 00	.....	.....	.....	.....
Oct., 1872	Charles Bird, Lt., A. A. Q. M.	Camp Bowie, Ariz.....	.....	.....	.....	.....	.....	.....
Oct., 1872	C. A. Vernon, Lt., A. A. Q. M.	In the field.....	.....	.....	.....	.....	.....	.....
Nov., 1872	J. F. Trout, Lt., A. A. Q. M.	Camp Date Creek, Ariz.	.....	.....	.....	.....	.....	.....
Nov., 1872	S. W. Fountain, Lt., A. A. Q. M.	Fort Wingate, N. Mex	1	50 00	.....	.....	30	\$210 45
Dec., 1872	N. E. Kingsbury, Lt., A. A. Q. M.	Fort Griffin, Tex.....	.....	.....	.....	.....	.....	.....
Dec., 1872	E. W. Stone, Lt., A. A. Q. M.	Jacksonville Depot, Oreg.	.....	.....	.....	.....	1	53 28
Dec., 1872	F. H. Edmonds, Lt., A. A. Q. M.	Fort Brady, Mich.....	.....	.....	.....	.....	.....	.....
Dec., 1872	J. McNutt, Major, A. A. Q. M.	Columbus Arsenal, Ohio.	.....	.....	.....	.....	.....	.....
	Grand total .....	.....	303	36,281 48	63	\$6,891 15	1,004	37,133 30

NOTES.

(a) Amount paid to captain and crew of quartermaster's steamer General McPherson.....	\$539 00
(b) Salary paid to captain of schooner	85 22
(c) Salary paid to captain of schooner	400 00
Total amount paid to captains of Government vessels, \$1,078.22, added to other totals above.	160,251 17
Total	161,329 39

PERSONS EMPLOYED IN QUARTERMASTER'S DEPARTMENT. 19

Department, by what officer reported, &c.—Continued.

MONTHLY PAY.															
Mechanics.		Teamsters.		Messengers.		Guides and scouts.		Mail-carriers.		Farmers on Gov- ernment farms.		Wagon and forage masters, United States Army.		Total.	
Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
1	\$57 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	\$57 20
8	825 00	.....	.....	.....	.....	1	\$60 00	.....	.....	.....	.....	.....	.....	10	1,010 00
3	225 00	9	\$221 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	571 20
.....	.....	.....	.....	.....	.....	1	80 00	.....	.....	.....	.....	.....	.....	1	80 00
.....	.....	11	425 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	425 00
1	120 00	.....	.....	.....	.....	2	45 00	.....	.....	.....	.....	.....	.....	3	165 00
14	387 40	10	104 11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	751 96
2	75 00	5	75 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	150 00
.....	.....	.....	.....	1	\$8 40	.....	.....	.....	.....	.....	.....	.....	.....	2	61 68
2	6 33	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	6 33
1	30 00	.....	27 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	57 50
709	51,228 37	720	19,935 03	42	2,176 50	65	4,270 42	9	\$1,172 62	47	\$891 60	4	\$270 70	2,966	160,251 17

RECAPITULATION.

Total number of civilians employed..... 2,966
Monthly pay of same \$161,329 39
Annual pay..... 1,935,952 65

STATE OF NEW YORK

Report of the Board of Regents of the University of the State of New York

for the year ending June 30, 1904

No.	Name	Age	Sex	Place of Birth	Date of Admission	Date of Graduation	Degree	Honors	Remarks	Total	Average	Grade	Class	Section	Teacher	Subject	Score	Percentage	Rank	Total	Average	Grade	Class	Section	Teacher	Subject	Score	Percentage	Rank
1	John Doe	20	M	New York	1902	1904	B.S.	First		100	85	A	1	1	Mr. Smith	Mathematics	95	95	1	100	85	A	1	1	Mr. Smith	Mathematics	95	95	1
2	Jane Doe	19	F	New York	1902	1904	B.S.	First		100	85	A	2	2	Mr. Smith	Mathematics	95	95	2	100	85	A	2	2	Mr. Smith	Mathematics	95	95	2
3	John Doe	21	M	New York	1902	1904	B.S.	First		100	85	A	3	3	Mr. Smith	Mathematics	95	95	3	100	85	A	3	3	Mr. Smith	Mathematics	95	95	3
4	Jane Doe	20	F	New York	1902	1904	B.S.	First		100	85	A	4	4	Mr. Smith	Mathematics	95	95	4	100	85	A	4	4	Mr. Smith	Mathematics	95	95	4
5	John Doe	22	M	New York	1902	1904	B.S.	First		100	85	A	5	5	Mr. Smith	Mathematics	95	95	5	100	85	A	5	5	Mr. Smith	Mathematics	95	95	5
6	Jane Doe	21	F	New York	1902	1904	B.S.	First		100	85	A	6	6	Mr. Smith	Mathematics	95	95	6	100	85	A	6	6	Mr. Smith	Mathematics	95	95	6
7	John Doe	23	M	New York	1902	1904	B.S.	First		100	85	A	7	7	Mr. Smith	Mathematics	95	95	7	100	85	A	7	7	Mr. Smith	Mathematics	95	95	7
8	Jane Doe	22	F	New York	1902	1904	B.S.	First		100	85	A	8	8	Mr. Smith	Mathematics	95	95	8	100	85	A	8	8	Mr. Smith	Mathematics	95	95	8
9	John Doe	24	M	New York	1902	1904	B.S.	First		100	85	A	9	9	Mr. Smith	Mathematics	95	95	9	100	85	A	9	9	Mr. Smith	Mathematics	95	95	9
10	Jane Doe	23	F	New York	1902	1904	B.S.	First		100	85	A	10	10	Mr. Smith	Mathematics	95	95	10	100	85	A	10	10	Mr. Smith	Mathematics	95	95	10

APPENDIX

1. The following table shows the number of students who have graduated from the University of the State of New York since the year 1900.

42D CONGRESS, }
3d Session. }

HOUSE OF REPRESENTATIVES.

{ Ex. Doc.
{ No. 210.

STATISTICS
OF
MINES AND MINING

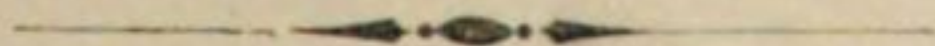
IN THE STATES AND TERRITORIES

WEST OF THE ROCKY MOUNTAINS;

BEING THE FIFTH ANNUAL REPORT OF

ROSSITER W. RAYMOND,

UNITED STATES COMMISSIONER OF MINING STATISTICS.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1873.

THE UNIVERSITY OF CHICAGO PRESS

CHICAGO, ILL.

1913

THE UNIVERSITY OF CHICAGO PRESS

CHICAGO, ILL.

CHICAGO, ILL.

CHICAGO, ILL.

CHICAGO, ILL.

CHICAGO, ILL.

CHICAGO, ILL.

L E T T E R

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

A report on the Statistics of Mines and Mining in the States and Territories west of the Rocky Mountains.

TREASURY DEPARTMENT,

Washington, February 13, 1873.

SIR: I have the honor to transmit the report of Rossiter W. Raymond, on the Statistics of Mines and Mining in the States and Territories west of the Rocky Mountains.

Very respectfully, your obedient servant,

GEO. S. BOUTWELL,

Secretary of the Treasury.

Hon. JAMES G. BLAINE,

Speaker of the House of Representatives.

LETTER

THE SECRETARY OF THE TREASURY

TO THE HONORABLE THE SECRETARY OF THE INTERIOR

DEAR SIR,

I have the honor to acknowledge the receipt of your letter of the 10th inst.

relative to the proposed sale of the public lands in the State of Texas.

I am, Sir, very respectfully,
Yours, very truly,
JAMES G. BAKER

Secretary of the Treasury

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NOTES

1. The first part of the paper discusses the importance of the study of the history of the United States. It is argued that a knowledge of the past is essential for a full understanding of the present and for the development of a sound policy for the future.

2. The second part of the paper deals with the question of the rights of the individual. It is shown that the rights of the individual are not absolute, but are subject to the needs of the community. The paper also discusses the question of the rights of the minority and the rights of the individual against the state.

3. The third part of the paper is devoted to a discussion of the question of the rights of the state. It is shown that the rights of the state are not absolute, but are subject to the needs of the individual. The paper also discusses the question of the rights of the state against the individual and the rights of the state against the community.

4. The fourth part of the paper is devoted to a discussion of the question of the rights of the community. It is shown that the rights of the community are not absolute, but are subject to the needs of the individual and the state. The paper also discusses the question of the rights of the community against the individual and the state.

5. The fifth part of the paper is devoted to a discussion of the question of the rights of the individual, the state, and the community. It is shown that the rights of the individual, the state, and the community are all interrelated and that they must be balanced in order to achieve a just and equitable society.

INTRODUCTORY.

WASHINGTON, *February 8, 1873.*

SIR: I have the honor to transmit herewith my report on mines and mining in the States and Territories of California, Nevada, Idaho, Oregon, Montana, Utah, Colorado, Wyoming, New Mexico and Arizona, together with such discussions and suggestions relative to the condition of this industry as are deemed important to the Government and the mining community.

The number of professional men and citizens who have co-operated in the preparation of this report is very large—larger, probably, than in any previous year—a circumstance which constitutes in itself a cheering evidence of the esteem which the intelligent population of the country has come to entertain for the endeavors of the Government to assist at once the general welfare and the special prosperity of mining and metallurgical arts by the diffusion of correct information. Due credit is given, throughout the following pages, for the contributions of these gentlemen. In this place particular mention will be made of a few only (without disparagement of others) who have furnished material of unusual value and amount, and thus rendered the present report in many respects the most practically important of the whole series to which it belongs.

Attention is called to the paper of Mr. Dutken, of Grass Valley, California, (constituting the greater part of Chapter XI,) on the treatment of gold-bearing ores in California. The thorough and trustworthy nature of this treatise is guaranteed by the character and ability of its author, and will be self-evident to the careful student of the text itself. Representing, as it does, the best American practice, it may be accepted as a true picture of the metallurgical and economical results of the stamp-mill process, in its present stage of perfection; and it must be confessed that there is shown to be greater loss in the best mills than has heretofore been supposed by cautious and close observers. The vague assertions of great waste of gold in stamp-mills, which have proceeded from the inventors of new and rival apparatus, or from unsuccessful managers, desirous to shift upon the deficiencies of “the process” the blame of their own failures, have naturally found little credence among practical operators; and experimental tests, as they are usually conducted, involve the serious error of reasoning from reactions and measurements on a small scale to alleged results upon the large scale. But Mr. Dutken’s impartial demonstration possesses the required element of method in metallurgical discussions—it is based on working

operations extending over large quantities and long periods. In every respect this chapter is recommended to the earnest attention of American mill-men.

The contribution of Mr. Ellsworth Daggett, of Bingham Cañon, Utah (Chapter XIII,) is characterized by the same peculiarity. It is a record of actual practice in smelting the lead and silver ores of Utah; and it is upon such records only that the comparisons may be based, out of which a complete art of American metallurgy can be built up. An example of the immediate practical use to which material of this kind may be put is found in the summary of Mr. Eilers, contained in Chapter XII, which, although based upon data in many respects incomplete, is nevertheless calculated to be fruitful in suggestions of value to metallurgists.

In Part III will be found a full discussion of the dynamics of water in geology and in mining. The natural processes by which gold has been accumulated in our placer and gravel deposits, and the imitation of natural processes by which, in hydraulic mining and in ore-dressing, the valuable material is separated by man from its earthy matrix or its worthless associated minerals, are set forth plainly and comprehensively. The essay (Chapter XVI,) by Mr. Bowman, on the Pliocene ruins of California, conveys the latest knowledge of the origin of the ancient auriferous gravels of the western flank of the Sierra, as obtained by the assiduous and acute investigations of the California geological survey, under Professor Whitney—labors in which Mr. Bowman bore no inconsiderable part, particularly as regards the subject here referred to.

Mr. Waldeyer's account of hydraulic mining (Chapter XVII,) will be universally recognized as the most complete description of this characteristic American industry that has ever been published. As a manual of practice it leaves little to be desired. The wide experience and the sagacity of the author entitle his views and recommendations on various points to the highest respect.

The brief but perspicuous explanation of the principles of ore-dressing (Chapter XVIII,) from the pen of Mr. Ward, is a timely contribution to the very incomplete knowledge of this subject now current in the United States. In view of the growing importance of separation and concentration, as a necessary element in the economy of mining operations, I can only regret that this chapter is so brief. A volume might well be filled with the details of an art so interesting at the present time to the mine owners and smelters of America.

The subject of the mechanical appliances of mining was ably treated by Professor Blake, in my report rendered March, 1870. In the present volume (Chapter XIX,) I present, with necessarily brief explanations, and without any attempt at critical discussion, a series of engravings, courteously furnished me by H. J. Booth & Co., of San Francisco, which represent the leading patterns, in several important departments, as now in use on the Pacific slope.

Thanks are especially due to several gentlemen who have taken much pains to collect and arrange the statistics of large districts, or whole Territories or States. It is believed that, in all these cases, complete acknowledgment has been made at the appropriate places in the report. If any omission has occurred, it has been unintentional, and will be sincerely regretted.

The intelligent and uninterrupted activity of my deputy, Mr. A. Eilers, has borne visible fruit in the portions of this volume specially credited to him; but its yet greater results, in the form of steady and trustworthy assistance, in all the departments of the work, I can only gratefully acknowledge, without attempting to define.

It is proper to mention also in this place the courtesy of the Union Pacific, the Central Pacific, and the Denver and Rio Grande Railway Companies; and of the stage-proprietors of Colorado, Utah, Nevada, and Idaho, who placed at my disposal the facilities of extensive travel. Wells, Fargo & Co., as in all former years, have shown, through their officers and all their agents, a ready and most sympathetic interest in my work, and have never failed to render efficient help. It will be seen, in several of the chapters of this report, that I have not been able to agree in all cases with the estimates of bullion-product, prepared in January by Mr. Valentine, the accomplished superintendent of the vast express-business of this company on the Pacific slope. But the difference is one of opinion merely, relating to those matters only which do not come within the precise accounts of the express-agencies. So far as the latter are concerned, I believe it is generally admitted that they have never been more accurately systematized than under Mr. Valentine's management.

According to the most careful determinations I have been able to make, the bullion-product of 1872, compared with that of previous years, was as follows:

	1869.	1870.	1871.	1872.
Arizona	\$1, 000, 000	\$800, 000	\$800, 000	\$625, 000
California	22, 500, 000	25, 000, 000	20, 000, 000	19, 049, 098
Colorado	*4, 000, 000	3, 675, 000	4, 663, 000	4, 661, 465
Idaho	7, 000, 000	6, 000, 000	5, 000, 000	2, 695, 870
Montana	9, 000, 000	9, 100, 000	8, 050, 000	6, 068, 339
Nevada	14, 000, 000	16, 000, 000	22, 500, 000	25, 548, 801
New Mexico	500, 000	500, 000	500, 000	500, 000
Oregon and Washington.....	3, 000, 000	3, 000, 000	2, 500, 000	2, 000, 000
Wyoming .....	.....	100, 000	100, 000	100, 000
Utah .....	.....	1, 300, 000	2, 300, 000	2, 445, 284
Other sources.....	†500, 000	525, 000	250, 000	250, 000
Total.....	61, 500, 000	66, 000, 000	66, 663, 000	63, 943, 857

* Including Wyoming.

† Including Utah.

The items in this estimate for 1872 are discussed in the different chapters of the following report. The decline of more than \$2,000,000 in production will not surprise those who are aware how disastrous has been the indirect effect of the prosperity of the more accessible districts upon the mining industry of Idaho, Montana, and Oregon. The placer-miners of these regions have emigrated in large numbers, attracted by the prospect of steady work in the quartz-mines of Nevada and Utah, or have turned their attention to stock-raising, a business which the completion of the Pacific railroads, and the rapid increase of the settlements along the railroad-belt, have rendered exceptionally profitable. The desultory industry which, during a few months of each year, produced from thousands of gulches and bars a large aggregate of gold, has been suspended, partly by the causes just named, and partly, no doubt, on account of the exhaustion of much of the ground formerly profitably worked without capital or machinery. But the treasures of these Territories are not exhausted. On the contrary, they have hardly been discovered. When the completion of the Northern Pacific and of various projected branches shall have made Eastern Oregon, Idaho, and Montana as accessible to trade and travel as are Colorado, Utah, and Nevada, it will be quickly made to appear that the mineral resources of our northern belt are as vast and as varied as those of any other part of the country.

The product of 1872 was about equally divided between gold and silver mines, if the bullion of the Comstock is reckoned in the latter class. The amount derived from systematic and permanent operations (quartz and hydraulic mines) is larger than ever; and this circumstance, so encouraging in itself, explains the impression entertained by many who ignore the former extent and present decay of small placer-mining operations, that the total yield of the country was greater. The transition from precarious surface-mining to organized, permanent, and extensive work is going steadily forward. Every year witnesses a substantial gain; and, though the aggregate production may fluctuate, there is no real retrogression, but a constant advance, in this most important industry.

I have the honor to be, yours respectfully,

ROSSITER W. RAYMOND,

United States Commissioner of Mining Statistics.

Hon. GEORGE S. BOUTWELL,

Secretary of the Treasury.

CHAPTER I.

CALIFORNIA.

PART I.

CONDITION OF THE MINING INDUSTRY.

THE CONDITION OF THE MINING INDUSTRY
IN THE UNITED STATES
IN 1907
BY
J. W. HARRIS
CHIEF OF BUREAU OF MINES
DEPARTMENT OF THE INTERIOR
WASHINGTON, D. C.
1908

PART I.

THE MINING INDUSTRY

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CHAPTER I.

CALIFORNIA.

Mining for the precious metals has prospered in California during the year 1872. In both vein and placer mines the general record has been a good one. Mr. Valentine, superintendent of Wells Fargo's Express, estimates the yield of the State, for 1872, as follows :

Gold by express	\$16, 493, 922
By other conveyance	1, 649, 392
Silver by express	232, 668
Ores and base bullion	673, 116
Total	19, 049, 098

Other authorities put the figure several millions higher, but I follow Mr. Valentine in his estimates for California and Nevada, though I have not hesitated to dissent from his figures for other regions. Mr. Valentine allows only 10 per cent., this year, for undervaluation of gold and shipments through private hands. The year before he allowed 20 per cent. for this item, but nothing for base bullion (from Cerro Gordo.) I therefore put the total for 1871 some \$320,000 higher than his estimate, while for 1872 I accept his figures, not finding any omission in them, and presuming that for the reduction of the percentage of allowance he has had good reason. For the State of California his authority is conclusive. I need hardly say that it is impracticable, with the means at the disposal of the commissioner, to obtain in that State complete detailed returns from individual mines. In consequence of the abundant rainfall of the preceding winter the ditches and reservoirs were not only replenished but the melting of the heavy body of snow on the mountains kept up the supply, prolonging the water-season beyond the usual period. With so much water for hydraulic operations the gold-product has been extremely large from this source.

In the drift-diggings, prosecuted mostly in the beds of the Pliocene rivers, the general results have been equally satisfactory, the miners here, after many years of disastrous experiment, having at last been enabled to determine with more precision the proper levels on which to run their exploratory tunnels. The quantity of gold-dust taken from some of these drift-claims in the past season has been enormous.

In vein-mining, while there are no signal events to be noted, there has been a steady and healthful progress, with fewer examples of failure than were common some years ago, when mills were built and started, only to run for a short time and then shut down, perhaps permanently. Almost every quartz-mill erected in the State during the past year has since been kept steadily running; and several mills previously built, which have been standing idle for years, have again been brought into service. The number of really good establishments of this kind now unemployed in the State is comparatively small.

While the annual product of gold in California has fallen off nearly

60 per cent. from the highest point at any time reached, the population engaged in mining has been diminished in a still greater ratio. In addition to manual labor, capital and skill are at present required, and share the profits that formerly accrued to labor alone. The net gains of the miner are much less now than when he was able to carry on the business without these auxiliaries.

In considering the probable future of gold-mining in this State another element, giving assurance of increased and permanent production, is presented in the great extent of the metalliferous territory, the discovery of additional and sometimes novel forms of deposit, and the manner in which certain of our placers may be said in some sense to renew themselves.

The California gold-field, which extends almost continuously over seven degrees of latitude, covering with its longer axis a distance of five hundred miles, includes an area larger than the State of New York. In no portion of this territory have the mines, other than the shallow placers, been exhausted or worked to any great extent. Even in the older and more populous districts few of them can be said to have been much more than thoroughly prospected, the majority not having been opened at all; while in the more remote sections of this gold-field still less work has been done, large districts remaining but partially explored.

Not only are the known mineral resources of the State multiplied by the finding of new localities and peculiar classes of deposits, but many former discoveries of this kind which, having failed to meet the high hopes excited at the outset, had been set down as worthless, are beginning to show themselves possessed of more merit than was at first conceded to them.

As already remarked, the year 1872 has been one of much activity and more than average success in all the more central and populous mining-districts of California. This is especially true of the placer-mines, from many of which the returns have been extremely large.

Quartz-mining.—The business of quartz-mining has been prosecuted with great energy and vigor in all portions of the State. Several new districts have been opened, and will, next year, add their quota to the gold-product. One of the most promising of these districts is in the northern portion of the State, near the Oregon line, in the counties of Klamath and Siskiyou. The development of the Black Bear, Klamath, and other mines elsewhere described, has attracted much attention to this section. The quartz-mines of Brown's Valley, Yuba County, abandoned for several years, have been re-opened with improved machinery. In Grass Valley and Nevada unusual activity prevails, consequent upon the revival of operations in several mines which have heretofore been closed or worked at a general loss. In this class we note the famous Eureka, which is again paying monthly dividends. On the mother-lode mining has also been prosecuted with success. Many of the leading mines of Amador County have been sold at large figures to English companies. At Quartz Mountain, Tuolumne County, the App and Heslep mines have been consolidated, and will be opened to great depth with new and powerful hoisting-machinery. In El Dorado County, the remarkable developments of the Saint Lawrence, Sliger, and Cedarberg mines have given a fresh impetus to mining in this, of late, neglected region. Two of the most noted of the California mines have, during the past year been worked by English companies, having offices in London—the Sierra Buttes, and Plumas Eureka. It has been impossible to obtain any data from these mines, all information being refused;

but it is believed that the product of each has exceeded \$250,000 for the year.

Situated in the extreme southwesterly portion of the State is the more recently discovered, but much less extensive, San Diego gold-bearing-quartz district. Brought into notice about two years and a half ago, this section has since made very fair progress, and, with some half dozen quartz-mills in successful operation, gives promise of continued productiveness. Details of the quartz-mining operations of the State are given under the heads of respective counties.

Gold on the northern coast.—The sands of the sea-beach, for some distance along the upper part of this coast and the coast of Oregon, contain a small proportion of gold, and have been worked with some profit for a number of years. This coast, from Coos Bay south for two hundred miles or more, may be termed the gold-coast of the United States. It has been laid off in districts, and claims located and worked under local mining-regulations. The flood-tides bring up the auriferous black sand, which, when sufficiently rich, is gathered and removed when the tide is out, and washed at leisure.

Gold has also recently been found back from the coast, at various distances, and at several localities. From two to twelve miles north of the Coquille, and from one to two miles from the present beach, and 180 feet by measurement above tide-water, is an auriferous deposit of black sand extending for several miles in length, which carries from \$2.50 to \$40 per ton, the latter figure said to have been attained by experimental working.

This deposit is said to be from 300 to 500 feet broad and 10 to 12 feet thick on its western or sea margin. It gathers to an edge on its upper or northern side, contains logs of lignite and often tasteless gum-resin. It is covered with from 40 to 60 feet of drift-sand, much of which is like soft rock, and this, again, is covered with a heavy forest, many trees being from 4 to 6 feet in diameter, and 50 to 200 feet high. This timber is heavier further back and lighter toward the sea. Further particulars of these deposits will be found in the chapter on Oregon.

Quicksilver in California.—During the past year great attention has been paid to the prospecting and development of quicksilver-mines, resulting in the discovery of many promising lodes, and warranting the belief that the future production of this valuable mineral will be greatly increased. In no other part of the world has cinnabar, the common ore of quicksilver, been found so widely disseminated as in California. Outside of California, and until the California discoveries, the world had depended almost wholly upon the old Almaden, of Spain, and the Idria, of Austria, for this important requisite in the collection of its metallic wealth. The old Almaden quicksilver-mine of Spain, it is well established, was worked seven hundred years before the Christian era, and is still producing more than any other.

The Mining and Scientific Press, of San Francisco, thus speaks of the present condition of quicksilver-mining in the State:

California, among its numerous mineral advantages, possesses the broadest fields of this necessary article in the world; and by far the most prolific of its mines is the well-known New Almaden, in Santa Clara County. As it may be interesting to know the amount produced from this mine yearly, as the representative one of California, the following figures will show it, in flasks, premising that the flasks contain 76½ pounds of quicksilver.

In 1851, the number of flasks produced was 23,875; in 1852, 19,921; in 1853, 18,035; in 1854, 26,325; in 1855, 31,860; in 1856, 28,183; in 1857, 26,002; from July, 1857, to October, 1858, 39,935. From that time to February, 1861, the mine was closed by injunction. From February, 1861, to January, 1862, it produced 34,765 flasks; in 1862, 40,391; in 1863, 19,564; in 1864, 46,216; in 1865, 47,194; in 1866, 35,150; in 1867,

24,461 flasks; in 1868, 25,628; in 1869, 16,898; in 1870, 14,000; and in 1871, 18,763 flasks. Total up to January, 1872, 537,176 flasks, each containing $76\frac{1}{2}$ pounds of quicksilver.

The New Idria mine in Fresno County produced, in 1866, 6,045 flasks; in 1867, 11,500; in 1868, 12,300; in 1869, 10,450; in 1870, 10,000; and in 1871, 9,227 flasks. The Redington mine, near Knoxville, Lake County, produced, in 1866, 2,980 flasks; in 1867, 7,145; in 1868, 8,700; in 1869, 5,000; in 1870, 4,546; and in 1871, 2,128 flasks.

Among the other mines whose product goes to swell the gross amount are the Guadalupe, in Santa Clara County, owned in Baltimore, Maryland; the Josephine, in San Luis Obispo County, owned by Barren & Co.; the Enriquita, owned by the Almaden, and the Bautista, owned by the Almaden, and now idle, both in Santa Clara County. The Pioneer is in Napa County; the Whitton is in Napa County, and there is one at Oakville; the Vallejo mine is in Solano County; the Manhattan, or Knox & Osborne mine, is three miles from Knoxville, in Lake County; the California is in Yolo, and there are several in Pope Valley near Napa; the Abbot mine is in Lake County; Excelsior in same county. There are several in Monterey, one of which is called the Pennsylvania, which produced a small quantity, and one owned by McGarrahan, not now being worked. There is one at Mount Diablo, Contra Costa County, which produced a small quantity, but is now in litigation. An occasional flask comes from the San Luis Obispo mines. The Riotte and Luckhardt mine is at Saint Helena, Napa County. The Phoenix, in Pope Valley, Napa County, produced, in 1870, from a partial working, only 763 flasks. There is also a mine in San Bernardino County, and several recent discoveries in Napa and Lake Counties, and a number are spoken of, from which we hear little, in the Coast Range, from up north down to San Bernardino County. The total product from all the California mines mentioned, for the last three years, has been estimated as follows: in 1869, 36,600 flasks; in 1870, 29,546 flasks; and in 1871, 31,881 flasks.

The total monthly product at present is said to be not over 3,100 flasks, of which the New Almaden furnishes 1,600, the Redington 600, and the New Idria 600, and all others 300.

The mines and works of the New Almaden, in Santa Clara County—the leading quicksilver-mine of California—have been repeatedly described by travelers, as well as in former reports of the Mining Commissioners. The New Idria, in Fresno County, though but slightly inferior in production at the present time, is not so well known. The following description of this valuable property is from a recent number of the Fresno Expositor:

In 1856 a party prospecting for silver in the southwestern part of Fresno County—the present location of the New Idria works—discovered a deposit of chromate of iron, which they supposed to be a silver-deposit, and for some time worked it as such before finding out their mistake. Here the party separated, some going one way and some another. Some of the party shortly after discovered cinnabar at the San Carlos mine, and at about the same time ore was found at the Idria mine, proper, in the company's grounds. Among the company's mines are the Idria, San Carlos, Aurora, Molino, Washington, Benada, and Victorener. The largest amount of work has been done in the Idria mine, proper. San Carlos has produced well and been quite extensively worked. The San Carlos mine is several hundred feet higher than Mount Diablo, and is the highest point in the range except San Benito, (misnamed on the maps of California, being named Pauchoe Peak,) which is quite near. San Carlos is 4,977 feet high, and Mount Diablo 3,876, and San Benito Peak still higher than San Carlos. The workings consist of tunnels, with communications by shafts from level to level, to a depth of 600 feet. The company are now engaged in erecting machinery, probably the heaviest of its character in the State, for the purpose of sinking 500 or 600 feet lower. The new machinery is being put up at a point 1,000 feet under ground. In the Idria (proper) the under-ground work will probably measure four miles. The mine has been producing constantly since 1857. The process for reducing the ore consists of thoroughly roasting the ore in furnaces holding from 50 to 60 tons, and the vapors (quicksilver at a temperature above 80° of heat passing off in vapor) condensed in large brick condensers, where it comes in contact with cold air. These condensers consist of a series of twelve to sixteen large brick compartments, having a single opening in each wall through which the smoke of the fuel and the vapors of the ore pass, finding their way to the chimney, before reaching which the quicksilver is supposed to be precipitated, and the wood-smoke finds its way out. The chimney alone is an institution worthy of note. It is built on the slope of the hill on which it rests, and is large enough to admit the passage of a man comfortably from top to bottom. The quicksilver rarely if ever reaches the top of the chimney.

Cases of salivation are frequent among the men engaged about the furnaces, caused by inhaling the mercurial vapors. These men handle the ore in a heated state, and tie heavy bandages over their mouths and noses to prevent the inhalation of mercurial fumes, and even with this precaution they are frequently salivated.

The numerous mines of cinnabar in Napa County are reported to be in a promising condition. Valley mine has yielded 13 flasks within a month, and the Washington, with a force of five men, has yielded 28 flasks, and a net profit of \$1,000 within the same period. The Phoenix has 4,000 tons of ore on hand, and has just resumed the work of reduction after a stoppage of four weeks for the modification and repair of its works. It is now prepared to furnish a large and continuous supply of quicksilver. The Oakville is also successful in operation. The Whitton mine, lately sold for \$45,000, is awaiting the erection of the reduction-works. The Valley Mining Company have completed their reduction-works, which promise to be very effective in the reduction of quicksilver-ores. The tests recently made of low-grade ores in their new and superior furnace are most satisfactory. Ores which have hitherto been considered as worthless have by the effectual process here introduced been made to yield satisfactory results. The new furnace has a capacity of 80 tons, and when thoroughly seasoned will be capable of reducing at the least computation 20 tons per day. The condensing-apparatus, which form so important a feature in the reduction of quicksilver-ores, are of the most improved and satisfactory kind, are kept cool by copious streams of cool water, and the mercurial vapors effectually condensed. The whole of these works bear the impress of careful and economical management. The company have about a thousand tons of ore on hand, and with the application of new machinery on their mine, they expect to have a continuous supply of ore for the furnace.

The Silver Bow mine is yielding a good supply of metal, and when consolidated with the Valley mine enterprise will be a very valuable property.

ALPINE COUNTY.

On the eastern slope of the Sierra Nevada, within California geographically, but geologically allied with Nevada, there are several mining-districts of importance, concerning which, by reason of their remoteness, less is said in the public press or heard from travelers than they deserve. They are comprised in the counties of Alpine, Mono, and Inyo. I am indebted for valuable notes on Alpine County to Mr. Lewis Chalmers, the able and courteous manager of the Exchequer Company in that county.

Since the spring of 1871, when the same gentleman wrote for my report of that year a brief notice of the mining-industries of Alpine County, considerable progress has been made in their development.

Silver Mountain district contains the county-seat and is topographically the highest of the mining-camps, the town of Silver Mountain being 7,000 feet above sea-level.

In this district the Exchequer Gold and Silver Mining Company, of London, limited, is one of the leading enterprises. At the head of Scandinavian Cañon, about two miles north of the town, 1,380 feet above the level of Main street, this company has been at work since February, 1870, when it bought the then undeveloped Buckeye No. 2, and Acacia mines. It has driven a main tunnel 900 feet, sunk on the ledge 140 feet from the tunnel, raised 128 feet of air-shaft, and run 912 feet of drifts in various directions, chiefly on the ledge. From several stopes some very rich ore has been taken out and milled at Reno and at the company's mill. The Reno ore gave \$140 per ton, in bullion 0.901 fine. For 60½ feet the ledge, which runs N. 17° W., dipped E. 76°. At

that point the dip changed to $53^{\circ} 30'$, which it maintained for 75 feet, when it flattened to $64^{\circ} 45'$, and continued so to the 140 level.

The country is an eruptive porphyry, changing in places to clinkstone or phonolite, bars of which are very hard and make slow sinking. The works above enumerated have developed a strong lode, beautifully cased with clay selvages between highly polished walls.

The ore is an antimonial sulphide, (ruby-silver, both light and dark,) mixed occasionally with silver-glance and the black sulphuret; matrix, quartz. About 200 feet from the mouth of the main tunnel, in a cross-cut to the hanging-wall, and 25 feet from the foot-wall, a vein was struck, of pure white gold-bearing quartz interlaid with veins of sulphurets, a piece of which yielded, gold, \$2,542.41; silver, \$5.16; total, \$2,547.57 per ton.

Having thus thoroughly opened the ground to a depth of 240 feet, the manager felt justified in recommending hoisting-works and a main shaft, for proper working. Since his return from London last June, machinery has been put up, capable of sinking 600 feet, and buildings to accommodate any extension which deeper working may in time demand. The main building measures 30 by 50, and 20 feet from floor to roof-plates, the roof being on a steep pitch; the carpenter's shop 20 by 22, with blacksmith's shop adjoining. The hoisting-frame is 24 feet high, with double sheaves. The engine is one of Bacon's double-cylinder hoisters, built by the Speedwell Iron-Works, of Morristown, New Jersey. The hoisting is done smoothly, at the rate of 100 feet in 34 seconds. Having no dead-center, the load can be started, stopped, or reversed at any desired point by simply turning a short lever. Pumping is done by one of Blake's steam-pumps, capacity 1,780 gallons per hour, which gives great satisfaction, and has the recommendation of occupying little room in the shaft. The engine-shaft measures 10 by 5 feet in two compartments. Water at present, 8,760 gallons in twenty-four hours, chiefly from thawing snows on the surface. The new shaft is 350 feet farther down the cañon than the main tunnel, and so placed that the floor of the hoisting-works is almost on a level with the bottom of the old incline, thus saving 140 feet of sinking and hoisting.

A strong tram-way and chute convey the ore from the upper works to the ore-dump on the road, 240 feet below the tram-way, whence it is hauled by teams to the mill on Silver Creek, about four miles distant.

This is the old Davidson mill, which was purchased by the company chiefly on account of its admirable situation, timber, and water-power. Built on the Freiberg barrel-amalgamation system, crushing dry, and roasting in the old reverberatories, it proved so expensive (though the process was efficient and the bullion 0.976 fine) that nothing but the highest grade of ore would pay to work, with labor at \$4 per day and skilled labor \$6 to \$8. The ore appeared so free from base metal that it occurred to the manager to experiment with wet-crushing and pan-amalgamation without roasting. Accordingly several tons were worked at the Tarshish mill, Monitor, which returned 68 per cent. of the assay; and the company's mill is now being converted into a wet-crusher. The barrels have been taken out and replaced by four Hepburn pans, with steam bottoms, the wooden settler by two 8-foot iron settlers, and a "clean-up" Knox pan on the same floor; the old frame, which was good, has been provided with new mortars, new mortar-blocks, new foundations, new cam-shafts, cams, stems, and tappets. Large additions were made to the mill to give room for sand-tanks and ore floors. The excellent 40-horse engine of the old works remains. It is believed that the cost of milling, including loss of quicksilver, will not exceed \$5.64 per

ton; extraction will cost \$2, and hauling \$2; in all \$9.64, say \$10 per ton. Concentration will be effected by one of Rickard's patent amalgamating concentrators, the inventor of which claims that it will enrich \$12-tailings to \$60. A retort-house, and an excellent assay-office, with melting-furnaces, are provided. The capacity of the mill is 16 tons in twenty-four hours.

Close by the mill is a circular-saw mill, with two saws, driven by a 60-horse turbine. Last fall, 370,000 feet of lumber were sawed for mine-timber and buildings. The company owns its own teams, which leave the mill with lumber for the mines, and return from the mines with ore for the mill. The ore assays all the way from \$15 to \$200. Specimens give \$2,000 to \$3,000. So soon as the engine-shaft is down to the 140 level, the manager expects to be able to furnish the mill with 16 tons a day.

Another English company, the I X L Gold and Silver Mining Company, limited, having purchased the I X L mine, 1,700 feet lower down the cañon, (which in 1862-'63 created no small excitement in mining-circles and gave birth to the town of Silver Mountain,) is busily at work also sinking an engine-shaft, now 110 feet deep. Hoisting works have been erected, duplicates of those at the Exchequer. At the 200 level, stoping will commence, and appearances in the old workings warrant the expectation of 20 tons a day. Some of the ore is of very high grade; \$50,000 was extracted from a very limited stope in the old works by former owners. A fine specimen of native silver from the lower tunnel, and a piece of pure ruby-silver, as large as a pigeon's egg, were exhibited from this mine in London. An expert cannot distinguish some of this ore from Yellow Jacket ore on the Comstock lode.

An analysis of I X L ore, (mostly native silver,) gave:

Gold	0.004	Alumina	2.700
Silver ..	0.551	Lime	0.700
Copper.....	0.080	Water	0.720
Lead.....	0.060	Silica	91.762
Antimony	0.010	Loss	0.013
Zinc	0.050		
Oxide of iron.....	2.600		100.000
Sulphur	0.750		

Twenty-four pounds of I X L ore gave—

Pure gold.....	6.720 grains.
Silver	925.650 grains.

Equal to £51, or \$250 per ton of 20 cwt.

Nine pounds of Buckeye ore gave—

Gold	1.575 grains.
Silver.....	233.887 grains.

Or about £34 = \$170 per ton of 20 cwt.

The company has purchased a convenient site on Silver Creek, with ample water-power, and will erect a mill this fall, should the shaft developments justify it. Unlike many American mines placed on the London market, the two above described have not been burdened with excessive nominal capital; and it may reasonably be expected that another year will find both of them on the dividend-paying list.

The only other mine now worked in this district is the George Washington, lately re-organized in Chicago. Two men only are at work at present, but it is said that a full force will soon be put on.

Monitor and Alpine districts.—Six miles north of Silver Mountain, on

the toll-road to Carson, is a small mining-town called Mount Bullion, through which runs the East Fork of the Carson River, separating the Monitor and Alpine districts.

On the Monitor side, the Imperial Company, of London, has driven a large double-track tunnel 1,406 feet through hard porphyry, to cut at right angles a series of parallel lodes. The work is now within 300 feet of the second ledge. Indications are reported promising, but the company has suspended work until the success of those mentioned above shall give fresh encouragement. The facilities for cheap mining and milling are at this point very good. The ledges are ten in number; the tunnel-location extends from the river to the center of the town of Monitor, 6,207 feet.

On the Alpine side of the river, the Mount Bullion Company, of London, has run more than 2,000 feet of tunnel, under the superintendence of Mr. Coulter, and expects to cut its first ledge in from 200 to 300 feet.

Half a mile down the river, the Monitor and Northwestern Company is running a tunnel from the Carson almost parallel to the Imperial tunnel, with the view of intersecting the same series of ledges, which appears very distinctly on the northwest side of Monitor Creek, the boundary between the two companies. This company has built a 10-stamp mill close to the tunnel-mouth, but has not yet cut its first ledge.

Returning to Bullion, leaving the main road on the right, and proceeding up Monitor Creek toward the town of Monitor, (a mining-camp with a present population of about 200,) we reach the Globe Gold and Silver Mining Company's mine and mill, on the right or eastern side of the creek. This company, under the superintendence of General Winchester, has done a considerable amount of work. About 300 feet from the mouth of its tunnel was struck a bunch or *Stockwerk* of gray sulphide of copper, some of which assayed as high as 37 per cent. copper, and \$20 in silver, with a trace of gold. On this the company commenced sinking, but had got down only 30 or 40 feet when the water proved too much for the machinery. The company is driving the main tunnel to the ledge, which is on the same belt as the Imperial, and which is expected to be struck in 60 or 70 feet. The mill has been run only experimentally.

On the western side of the creek, and within a few hundred yards of Monitor, is the Monitor and Northwestern Company's silver-glance claim. On this the company has run 300 feet of tunnel, drifted west, and found small pockets of rich ore, chiefly silver-glance and black sulphuret, but not, it appears, in quantity sufficient to run their mill at Bullion steadily. They are now sinking from this west drift, and find, occasionally, bunches of high-grade ore. A tram-way from the mine leads to an excellent ore-house.

We now come to the Tarshish, the representative mine of Monitor, situated on the outskirts of the town, and belonging to the Schenectady Silver Mining Company. Considerable work has been done on this mine since the year 1863. The vein-matter, consisting of a highly metamorphosed laminated sandstone, lying at an angle of about 80° , has been cut by both upper and lower tunnels, at about 450 feet in the former and 900 in the latter. An incline has been sunk 225 feet, connecting the upper with the lower works. From this incline drifts have been run north and south, on the course of the ore-deposit, which can be traced on the surface for a mile, all of which have yielded more or less ore, generally in clayey pockets. From one of these pockets \$10,000 was taken in rich black sulphide, which was washed by hand-jiggers, and sold in San Francisco for \$2,000 per ton. From the upper tunnel about

1,500 tons of ore have been extracted, the greater part of which still remains on the dumps. It assays about \$30, and came principally from an excavation raised from this tunnel some 80 or 90 feet. The ore is an argentiferous zincblende, averaging about 7 per cent. of zinc, and carrying about one-third of its value in gold. It also contains a quantity of iron-pyrites with traces of copper-pyrites. The pink carbonate of manganese is met with in the hard rock in the vicinity of the rich clay pockets. The country-rock is a soft, greenish-blue porphyry.

A 20-stamp mill was erected in 1872, with a White's revolving roasting-furnace. Three hundred tons were worked, when operations were suspended in consequence of the furnace failing to do its work, the chlorination not exceeding 47 per cent. of the assay value. Wet crushing was then tried, but abandoned, the clayey nature of the ore preventing its settling in the tanks. The funds of the company being exhausted, the mine and mill are at present idle, with the exception of two miners engaged in explorations from the lower tunnel. The work of these two men has shown that the ore is increasing in quantity below the level of the tunnel; and it is the intention of the company to erect hoisting-works this spring, it being the general opinion that this mine will prove a good investment if properly worked in depth.

Mogul district.—Of this district, lying north of the Monitor, the Morning Star used to be the representative mine. It has not been worked for three or four years. Good cupriferous silver-ore, associated with a very large amount of iron-pyrites, has been from time to time taken out and sold in San Francisco at from \$100 to \$150 per ton. A parcel sent to Swansea sold as high as \$300 per ton. There is a very complete set of steam hoisting-works and pumps, and it is said work will soon be resumed.

The leading mine of this district at present is the Leviathan copper-mine, for a full description of which I am indebted to Mr. W. T. Rickard, F. C. S., of London. I give his account in full:

The Leviathan mine is situated five miles north of the town of Monitor, in the Great Mogul mining-district. The property is covered by fine timber, and the Leviathan Creek running through the claim, and communicating with the Carson River, furnishes an abundant supply of pure water all the year round. Following the course of this creek, a toll-road has been surveyed, which, when completed, will enable the mine to ship ore at all seasons of the year, at very moderate rates, to the San Francisco market, via the Central Pacific Railroad branch through Carson, an extension of which is expected to be made shortly to the Aurora and Cerro Gordo districts, which will then place the Leviathan within twelve miles of railway communication—a most important feature in copper-mining operations.

The claim consists of 3,800 feet, running north and south, having an average surface-width of 1,000 feet; the geological formation being metamorphic sandstone, which can be traced over two miles in a north and south direction, beside other outbursts in different parts of the locality, all of which are more or less metalliferous. This sandstone reposes on a formation of blue clay, with water-worn boulders of trachyte, varying in size from a pebble to masses of several tons' weight. The formation dips 30° E. The west country-rock is trachyte, that on the east gray porphyry.

This mine was opened in 1863 by some poor working miners, who drove in a tunnel about 400 feet, with an air-shaft some 150 feet beneath the croppings. Finding neither gold nor silver, and not considering the copper which had been struck worthy of attention, they abandoned the undertaking, and it remained in abeyance till 1869, when operations were resumed by the late Edward Dorsett, of London, under my superintendence, with a view of developing the very promising indications for copper. This work has opened out an immense deposit of unusually rich ore, two-thirds of which have proved, from sales of some 500 tons taken out during the exploratory operations, to carry over 30 per cent. copper. The quantity now in sight has been variously estimated, by some of the best judges in California and Nevada, at from 1,500 to 2,000 tons.

With a view of draining the upper works, and taking out ore to better advantage, a second tunnel has been run, 176 feet, below the upper one. This is now in 928 feet.

An incline also has been started to connect the two tunnels, and is now completed within 30 feet. When the connection has been effected, perfect drainage and ventilation will be secured; and it is estimated that a minimum of 10 tons per day can be taken out for \$2 per ton.

Up to the present time the explorations in the upper tunnel have not reached the boundaries of the first deposit struck in 1863, though it has been opened out to a circumference of 300 feet horizontally on the floor; and for 60 feet down the incline, ore of 55 per cent. copper, connecting with the same deposit, (bunch or *Stockwerk*,) has been gone through, from 3 to 5 feet in thickness. Twenty-five feet below this is a stratum of sandstone, 20 feet thick, impregnated to the extent of 26 per cent. with pure sulphur.

The copper is mineralized in the form of silicate, black and red oxides, and gray sulphide, with metallic copper in a finely-divided condition. The sulphide predominates in depth, and the oxidized ores near the surface, while over all is found the customary deposit of red oxide of iron, (the "iron hat" of the Germans.)

In addition to the large deposit discovered in the upper works various other deposits or bunches have been found in other portions of the sandstone, which appears mineral-bearing from the croppings to its lowest part, resting on the clay and boulder formation, a thickness of more than 300 feet, evincing thus its identity with those practically inexhaustible deposits of copper found in the celebrated sandstone formations of Bolivia and the Isle of Anglesea.

In consequence of the death of the late enterprising proprietor, operations are at present suspended; but it is expected they will soon be resumed by an English company, with sufficient capital to complete the opening out of the mine, and erect bluestone works for the purpose of utilizing the low-grade ores, which cannot at present be shipped to advantage.

The existence of an apparently unlimited supply of sulphur for the purpose of manufacturing the sulphuric acid required for producing the bluestone, and the absence of lime in the matrix, together with the unusually small proportion of iron found in the ore, offer peculiar advantages for the manufacture of sulphate of copper on the spot, whence it can be delivered to the Washoe market at a cost not exceeding one cent per pound, and find a ready sale to the extent of from 5 to 7 tons per day.

The Leviathan mine has been nearly self-sustaining for the last two years; the ore taken out in merely exploratory operations having realized over \$30,000 by sales to the bluestone manufacturers of Nevada and California. The production of bluestone at a cheap rate, within fifty miles of Virginia City, will doubtless prove a great boon to the Comstock mines, the economical reduction of these ores being greatly dependent on the liberal use of this indispensable article, particularly in reworking tailings.

It may be mentioned in conclusion that copper has been found in a north and south direction in the Pine Nut range of mountains and its spurs, forming the eastern boundary of Carson Valley, all the way from near the town of Dayton to the Leviathan mine.

Up to a recent period the mines of Alpine County have been mostly owned by poor miners and others, who, unable or unwilling to work themselves, have steadily refused to sell unless at highly exaggerated, in fact ridiculous prices. Tired of playing this part they at last offered inducements to Eastern and English capitalists, who found the mines totally undeveloped. This will account for the time which has elapsed since the discovery of the mines without the achievement of satisfactory results.

MONO COUNTY.

This county contains the following mills: The Pioneer, at Montgomery; an arrastra, barrel, and lavadero roasting-furnace now being added; run by water-power; worked last summer 125 tons of ore, assaying from \$100 to \$700 per ton; average \$247 per ton. Extracted about 85 per cent. of assay, and paid well. Also worked over about 100 tons of tailings. Riley's mill, also in Montgomery; small stamps and pans; run by water-power; formerly profitable, idle and dilapidated now. A small mill at Hot Springs, owned by J. Partz; four small stamps; barrel and separators; water-power; process same as Pioneer mill, working about a ton a day, and fairly profitable. W. J. Williams & Co.'s mill was built in 1871; steam-power, ten stamps, two pans, two separators, and a White's furnace.

One of the most important mining enterprises of Mono County is that of the Dunderberg Mining Company, of San Francisco. The Dunderberg mine is situated at Castle Peak, on the head-waters of East Walker River, formerly a placer-region of some note. It was discovered and located by Charles Snyder & Co. several years ago, and was afterward purchased by Dr. George Munckton and others, of Carson, Nevada. When they made the purchase a shaft had been sunk on the ledge to the depth of about 40 feet, from which were taken about 100 tons of ore. Three tons, of an average grade, were hauled to Aurora, about thirty miles, which paid by mill-process over \$50 to the ton, being about three-quarters gold and one-quarter silver—the bullion being worth \$4 per ounce. Munckton & Co. then started a tunnel, which has been run a little over 600 feet in length, which taps the ledge about 250 feet from the surface. They then cut across the ledge 34 feet, but failed to find the hanging or west wall, (the ledge running north and south,) but being in vein-matter the whole distance. On the foot or east wall there were about 5 feet of solid quartz, the bottom being more or less mixed with porphyry and slate formation. The company then ran drifts both north and south along the foot-wall for about 300 feet, which does not vary a foot from a straight line the whole length. They found continuous quartz the whole distance, varying in richness. A stope, started up over a portion of the richest ore, did not hold out as good as it was below, showing that to get out the richest ore in large quantities it requires greater depth. Several hundred assays made by the company for their own private use, to see what to select and what to reject in running other drifts, averaged nearly \$100 to the ton. Reduction-works were erected some time ago, when it was found that to work that rich ore closely the amalgamating part of the works required a change. It is the intention of the company to make several cross-cuts across the ledge to the west or hanging wall, and to sink deeper on the ledge, where they are confident of taking out rich ore. It is estimated that the ore can be mined and milled for less than \$10 per ton.

INYO COUNTY.

The gold-mining industry in this county has always been greatly inferior to that which has, within the last few years, sprung up in connection with the silver-mines of Cerro Gordo mining-district. Still, the usual limited activity has been displayed by a few Mexicans, who work, in a dilatory way, gold-mines situated some fifteen or twenty miles southeast of the southern end of Owen's Lake. They work altogether with arrastras, and sell their product, amounting to a few thousand dollars a year, from time to time at Lone Pine. The mills erected several years ago at the base of the Sierra Nevada, southwest of Lone Pine, one of them a large establishment, are idle.

The lead and silver mines have done better than ever before, as will be seen from the production during the year given below. Although one of the works, that of the Owen's Lake Silver-Mining Company, was compelled to stop smelting during a great portion of the year, its furnaces having been shaken down by the severe earthquake of March 26, 1872. The shipments of bullion from Cerro Gordo district exceed those of the previous year by over 1,000 tons. These works are located on the east shore of Owen's Lake, in the valley, and stand on ground which subsided from two to five feet during the disturbance. The works are by this time rebuilt and enlarged, there being now three shaft-furnaces instead of the two formerly in existence. But the shaking down of the

furnaces, which were in blast at the time, and therefore came very near burning the buildings, was not the only damage done here by the earthquake. A permanent inconvenience is the fact that since the occurrence of the phenomenon, water is encountered in the floor of the building upon even digging to the slight depth required for lead and slag basins outside of the furnaces. The difficulty was overcome by inserting iron kettles into the excavation necessary for the metal-basin, and by using iron pots to remove the slag.

The mines which have furnished almost exclusively the ore for the three smelting-works in the district are the Union, Santa Maria, and Belmont. The two former have furnished the lead-ores, while the latter, together with half a dozen smaller mines, yielding irregularly a few tons, has produced the cupriferous silver-ores, added to a greater or less extent to the charge in all the works. The San Ignacio and San Lucas, both favorably regarded in previous years on account of rich and large ore-bodies near the surface, are now idle, the known bodies being worked out and new ones not having been discovered. It should, however, be said, in justice to these mines, that the work of exploration has not been extensive nor carried out with much ability.

The Santa Maria and Union are situated on the western slope of Buena Vista Mountain, directly above the mining-town of Cerro Gordo, from the streets of which some of the tunnels, driven into these two deposits, have been started. Both deposits run on top with the strata of the country-rock, crystalline limestone, and clay-slate, and approximately with the axis of the mountain. They were formerly known also as Freiberg Nos. 1 and 3, but lately all interests in the two deposits have been consolidated, so that at present the Union is owned by Messrs. Belshaw, Judson, Beaudoy, and others, while the different interests centering around the Santa Maria have all been gathered in the hands of the Owen's Lake Silver Mining and Smelting Company of New York.

The Union, the highest on the mountain-side, has undergone considerable development during the past year. On the surface the ore-body strikes about S. 30° E., and dips steeply to the southwest. But at the level of the main working-tunnel, which strikes the Union at a depth of about 175 feet from the surface, the ore-body begins to stand nearly perpendicularly, and continues so for a depth, below this level, of 165 feet, the lowest point reached in September, 1872. At a depth of 200 feet below the tunnel a branch leaves the main ore-body toward the west. Its dip is very flat, and it has been followed over 100 feet, always in very excellent ore, the greater part of which is galena. This branch is about 3 feet thick. It is thought and hoped by the owners of the Union that it will eventually run into the Santa Maria; and as the Union has the older title, the independent existence of the Santa Maria would in that case be endangered. The longest level on the vein in the whole mine is the one driven at a depth of 200 feet below the tunnel, and even this one is little over 100 feet long. But the ore-deposit, as developed by this level, and the work done in the 65 feet below, is of extraordinary extent, being in many places 40 feet wide and nowhere less than 15. At the same time the ore is very solid, being either reddish-yellow carbonate, or pure gray carbonate, lying in great blodges in the former. The masses of the latter kind have frequently a diameter of from 3 to 6 feet, and always show a concentric arrangement; *i. e.*, every mass of this kind, which has been cut through by the excavations, shows concentric rings around an interior nucleus, (generally a small lump of unaltered galena,) the rings being somewhat darker than the main mass. This arrangement presents a beautiful aspect, and though

common with gray carbonate of lead, when lying in a ferruginous gangue, it is not often seen on as large a scale as exposed in the Union. The carbonate-ores of the Union, on account of their friability termed "fuse-ores" by the miners, average, as delivered to the furnace, about 25 ounces of silver per ton, and the galena from 50 to 80 ounces.

The Union is sufficiently opened to show a really very large amount of ore ready for stoping and raising, but the facilities for bringing it to the ground were, up to the fall of 1872, very limited and entirely inadequate to the resources of the mine. The main shaft starts, as mentioned before, from the level of the tunnel, which strikes the ore-body 175 feet below the surface. To this point the ore is raised in buckets by horse-power; here it is dumped into cars, and taken through the tunnel to the surface, where the fine ore is separated from the galena before transportation to the furnaces. During the latter part of the year, I am informed, the owners erected steam hoisting-works, which were in successful operation at the end of the year. The furnace belonging to Belshaw and Judson is not more than 150 yards distant from the mouth of the main tunnel. It is built on a slightly higher level than that of the tunnel-mouth, and in a saddle of the main ridge of Buena Vista Mountain, so that it actually stands on the very water-shed. The back of the ridge here is not over 150 feet broad, and from the furnace-door one can look into the valleys on both sides of the ridge. If it was one of the objects of the owners, in locating the furnace here, to secure sufficient dumping-ground for the slags, they have assuredly most amply succeeded, for there is probably no smelting-works in the world which stand so well provided for in this respect, with a slag-dump over 2,000 feet high on two sides. But the main reason for locating the furnace where it now is was probably the convenient and central location in regard to the mines of the district, the lead-mines being located on the western slope of Buena Vista Mountain, while many mines carrying cupriferous copper-ores are on the eastern declivity, both classes lying high up on the mountain, and the outcrops of most of them being above the level of the smelting-works.

Beaudoy's Smelting-Works, lying in a ravine on the western slope of Buena Vista Mountain, in the town of Cerro Gordo, and a couple of hundred feet below the level of the working-tunnel of the Union, smelt also mainly ores from this mine. There is only one shaft-furnace of the same size as Belshaw's. Both of these works, and their method of working, are described in another part of this report.—(See Metallurgy.)

The Santa Maria is located lower down Buena Vista Mountain, and nearer to the town of Cerro Gordo than the Union. It runs generally parallel to the latter, and is separated from it by a stratum of clay-slate, which varies in thickness from 30 to 120 feet, and a varying stratum of limestone. The Santa Maria lies closely to the slate, which dips on the surface 64° west. The upper works in the deposit show that it is completely broken down near the surface, so that it is here much wider than lower down, and apparently tipped over, *i. e.*, it dips to the east; but at a depth of about 60 feet the dip changes to the west, becoming conformable with that of the slate. Much work of an irregular character, evidently wanting in a uniform plan, has been done on this deposit. Several tunnels and shafts have developed the following so-called chambers, some of which are now worked out. In going along the vein from north to south they are:

1. The Santa Maria chamber, 25 feet wide and 50 feet long.
2. The front chamber, 15 feet wide and 40 feet long. This ore-mass

lies, not on the strike of the vein, but west of it, and lower down the hill. It is in soft, gravelly ground and broken rock, evidently a part of the former outcrop, which is tipped over and has been partly covered up by other detritus.

3. The Schneider pocket, on the course of the vein.

4. The Buena Vista pockets, 180 feet long and from 5 to 30 feet wide.

The Omega Tunnel, driven from below Belshaw's Smelting-Works obliquely toward the Santa Maria, (it has, however, several branches and windings in all directions,) strikes the Santa Maria deposit at a depth of over 200 feet from the surface. This tunnel has lately also been acquired by the Owen's Lake Silver Mining and Smelting Company, of New York.

The latest accounts I have from this district are dated December 18, 1872. They were furnished by Mr. William H. Van Arsdale, E. M., the superintendent of the last-named company, whose valuable assistance to Mr. Eilers, when visiting Cerro Gordo district in the fall, I take here occasion to acknowledge. In his late letter he says in regard to the Santa Maria mine:

I have been engaged in removing ore from the upper part of the Santa Maria mine, and in exploring the same at and below the level of the Omega Tunnel.

About 100 feet south of the original Santa Maria workings I have found a body of ore 50 or 60 feet from the surface, which I have uncovered for a considerable extent on top. It is from 10 to over 20 feet wide, 50 or 60 feet long, and, so far as I know, 50 feet deep, a mass of galena and oxidized ores. More or less ore is also found in the vicinity of this solid mass on either side. I have removed about 600 tons from it, a small part of the whole.

The vein seems to have changed its direction somewhat at the level of the Omega Tunnel, (over 200 feet from the surface,) and seems to run in more of a northerly and southerly direction than on the surface, where the general course of the deposits is about S. 30° E. The character of the lode is also different on that level, where, at the northern end of the works, galena and soft ores predominate, with some quartz, while at the southern end there is but a vein of quartz tolerably uniform in size, and, at the back, where it is being worked, carrying galena and copper ores, much mixed with quartz, from 3 to 8 feet of the width of the vein. The rock, as taken out without careful sorting, averages from 60 to 90 ounces per ton in silver.

In the northern workings we have gone down 160 feet below the tunnel in galena and carbonate of lead, apparently increasing in width toward the bottom. We have also drifted 180 feet on the level of the tunnel, and 100 feet at 110 feet below the tunnel, on more or less ore all the way. This ore is much richer than that near the surface. I have taken possession of the Omega Tunnel, and stopped all work outside of our own vein. I understand that the Union mine is doing as well as ever.

The smelting works of the Owen's Lake Silver Mining and Smelting Company are situated at Swansea, on the eastern shore of Owen's Lake, ten miles from Cerro Gordo. The difference in the level between the two places is over 2,000. The working of these furnaces, before their destruction by the earthquake and their subsequent rebuilding, is described under "Metallurgy" in another part of this report. An account of the operations of these works since Mr. Eiler's visit in that region is contained in Mr. Van Arsdale's letter above referred to. He says:

After you left this place I completed my flues and chimneys, and erected another furnace. I blew in one of the furnaces on October 20, and ran thirty-six days, producing 142 tons of lead. Then I stopped that furnace and started the other, and have continued to produce bullion at about the same rate. I used on an average 3½ tons of lead-ore per ton of lead made. I employed very little of the argentiferous copper-ore. The matte I re-treated in the same furnace. The dust-deposit from the flues I mixed with the fine oxidized ores in a sluice-box, thus washing out the carbon and clay. The resulting fine-ore I dried partially and charged it in the furnace-damp. The result was very satisfactory. I saved nearly all of it. I used about 1 ton of galena and 2½ tons of the oxidized ores per ton of lead produced, and about 30 bushels of charcoal per ton of ore.

When formerly the ores were roasted and slagged in the "galenador" there was

much less coal employed in the subsequent fusion. The slags produced in this last run contained 2 to 5 per cent. of lead, and never over \$1 in silver per ton; generally very much less.* I have not treated nor found lately any ores with an appreciable quantity of gold.

From December 1, 1871, to December 1, 1872, the freight-contractors for the bullion removed from the Cerro Gordo furnaces (Belshaw's and Beaudoy's) 2,600 tons of lead, the richness of which is not stated. From the works at Swansea there were removed 620 tons of lead, carrying from \$120 to \$340 of silver per ton. A small part of the latter was even much richer. To judge from former shipments, the bullion from Belshaw's and Beaudoy's furnaces has probably averaged about 140 ounces of silver per ton, and that from the Swansea works 150 ounces.

The total shipment of base bullion from Cerro Gordo district during the year from December 1, 1871, to December 1, 1872, and its approximate value, was therefore:

From the works of—	Number of tons.	Number of ounces silver per ton.	Total value of silver at \$1.2929 per ounce.	Total value of lead at 6c. gold per pound.	Aggregate value.
Belshaw & Beaudoy.....	2,600	140	\$470,615 60	\$312,000	\$782,615 60
Owen's Lake Silver Mining and Smelting Company.....	620	150	120,239 70	74,400	194,639 70
Total.....	3,220	.....	590,855 30	386,400	977,255 30

The question of procuring cheap fuel is, in Cerro Gordo, the same as in nearly all smelting-districts of the West, one of great importance and not easily solved. The price paid for charcoal at the furnaces in the town of Cerro Gordo (Belshaw's and Beaudoy's) was 32½ cents per bushel in the latter part of 1872, and the smelting-works at Swansea, even, were obliged to pay 30 cents, though the latter are favorably located for procuring fuel across the lake from the Sierra Nevada. The supply of wood on the Inyo Mountain, though of the best quality for charring purposes, (piñon,) has lately become so precarious and expensive that various schemes have been talked of for securing cheap transportation of the abundant stores of wood and timber in the Sierra Nevada. A small steamer was built last year, which commenced running in the early fall, and has since then transported base bullion from Swansea to the southeast end of the lake. On the back trips it is loaded with merchandise and other necessary supplies for the mining and smelting establishments. Some forty or fifty miles of an exceedingly bad road around the upper end of the lake are thus avoided, and the distance to Los Angeles is materially shortened. To that point, distant not less than two hundred and seventy-five miles, all the bullion has so far been shipped, the road leading over sandy deserts most of the way.

It is now proposed by Mr. S. Stevens to build in Cottonwood Cañon, which opens upon the lake about midway of its western shore, a large flume, with branches in the side cañons. At the upper end of this cañon, and at an elevation of about 5,000 feet above the lake, is a series of val-

* This great improvement in the production of poor slags is undoubtedly due to the omission from the charge of the quartzose copper-silver ores, which were formerly much used, occasioning the formation of silicate of lead, to decompose which there was not sufficient iron-oxide present.

leys containing many square miles of forest, which will be rendered available for fuel by means of the flume. The latter is intended to be from six to twelve miles long, and there is an abundance of water for it. The timber growing along its course will be serviceable for lumber and mining-timbers as well as for charcoal. It is thought that the flume can be finished and ready for use by the end of the summer of 1873, and that then charcoal can be laid down at Swansea for less than 20 cents per bushel.

THE SOUTHERN COUNTIES.

The mineral-field of Southern California is scattered over a very extensive area comprising the counties of San Bernardino, Fresno, San Luis Obispo, Kern, Tulare, Los Angeles, and San Diego. Within the limits of these counties are found gold, in placer and quartz, copper, silver, cinnabar, and tin, though, with the exception of one or two districts in San Diego and Kern Counties, there are no communities in which mining is the predominating interest. In fact, so far as all this part of the State is concerned, the mineral-resources may be looked upon as undeveloped, if not undiscovered. Tin in considerable quantities has been discovered in San Bernardino County, but being within the limits of private land-grants, the development of the mines has not been as energetically prosecuted as it would have been on the public domain.

The San Jacinto tin-estate is in San Bernardino County, about fifty miles east of Los Angeles, where, it is said, the company have fifty tin-bearing ledges, some of them with the unusual breadth of ore of 13 feet. Kern County, an early placer and a later quartz-mining locality, and one having experienced good and evil fortune, is now recovering from a long season of depression, with a most encouraging prospect of becoming a flourishing and progressive mining-county. Old mines, that have been lying idle for the past six years for the want of proper knowledge of the manner in which they could be worked profitably, and which were formerly under the control of superintendents who never saw a mine before they came here, have been relocated and worked to advantage. We can refer to many instances involving great losses; and again, to the very same places which, on being worked by competent hands, have paid handsomely, much to the wonder of their former workers. This only illustrates the vicissitudes and trials that have marked the general history of quartz-mining on the Pacific coast. Beginning at a time when labor and material were enormously high, ignorant of the requirements of the business, and overlooking many treacherous elements of defeat, the miner and mill-man were baffled alike, and subject to disappointment and loss in consequence of a lack of knowledge concerning mining. Seven years of constant working and experiment have overcome all former impediments, and mining in this county is no longer an experiment. Not only are the mine and management now here perfect, but the mill and plant are first-class, all the late labor-saving appliances and other advanced improvements having been added, greatly increasing the efficiency of profitable mining.

The Havilah Courier says of the mining-region of which Havilah is the center:

The mineral-belt carrying the system of veins here, pursues a northwest and southeast direction. It is about forty miles wide and seventy miles long, the town of Havilah being located near its center. There are many other mines in the county situated in smaller belts which bound it on the east near Sageland, and on the west at White River. Within our area the bulk of the more extensively developed mines are located. The entire belt is cut and ribbed with gold-bearing veins which cut its course diag-

onally, running generally in an easterly direction. The vein-matter is principally quartz, very little foreign rock being discovered in it. Its walls are always granite or slate. The ledges, though almost invariably well walled, are not massive, but in keeping with the general average width of all gold-bearing ledges on the coast, varying from $2\frac{1}{2}$ to 6 and 10 feet. The Big Blue lode at Kernville is between 60 and 70 feet thick. They pitch at angles of 35 to 85 degrees.

The mineral-belt to the west of Havilah commences at White River, running from Tulare into Kern County, ranging from there to Long Tom mining-district, thence east to Delonega mining-district. Skipping a few miles over an unprospected country brings us to the once famous Keyseville mining-district, which was abandoned some years ago in consequence of the old cause—bad management and inexperience. A few miles to the right of Keyseville is Kernville, which has now all of its stamps in operation on rock of a very rich grade. Crossing Kern River to the Havilah side, the mines in this large belt continue, the first mining-district being the Washington, which includes Havilah, with its numerous mines, and extends south to Caliente mining-district, a distance of thirty miles. The leads mostly run east and west in this portion of the belt. Next to this comes Erskine Creek, where the lodes do not seem to obey any rule, but run at random in net-work style. The lodes of the newly-discovered mines, Grizzly Mountain district, run almost directly north and south. In Pi Ute, Sageland, and Claraville districts the ledges run nearly east and west, varying slightly toward the north and south occasionally. The most of the rock in this district is of the best high-grade ore, and turns out under the stamps \$20 to \$38 per ton. The deep mines of the county which have been fairly tested, develop an increase in the width of the ledges. By way of illustration, we cite the Saint John and Bright Star mines, which were only 3 feet in width when first struck. They both held this uniform width until down 260 feet, when the ledges commenced to widen without any decrease in the richness of the quartz, which pays from wall to wall the same as before the extension in width. The ledges are now almost 8 feet in width, with a tendency to still increase.

SAN DIEGO COUNTY.

The mines of this county* are mainly situated in Julian and Banner districts, in the Santa Isabella Mountain, about sixty miles by stage-road northeast of San Diego. Attention was first called to them early in 1870, and a temporary excitement was caused by the reported richness of the ore. As usual in such cases, the value of the quartz was somewhat exaggerated; and the recognition of this fact occasioned a reaction. Julian district fell into bad repute. Moreover, a prejudice exists, or did exist, among the people of San Francisco and Northern and Middle California, against San Diego County. For this reason it was difficult to procure capital to develop the claims. However, as a few claims showed evidence of being worth working, a small population remained after the first rush was over; and to them the camp owes its present prosperity.

Little seems to be known of these mines, even in California, outside of those interested in the advancement of the county; and it has been difficult to obtain any details of the working of particular mines. The geological features of the district in which they are situated have been given at length in a former report of the Mining Commissioner. The formation is slate, sparsely interspersed with granite, in which the veins run northeast and southwest. One of the most prominent mines, however, the Golden Chariot, is located at the junction of granite and slate. The auriferous belt is, as nearly as can be ascertained, about four miles in width by ten in length. The veins are unusually numerous, but small; few, if any, blind lodes have been discovered; the majority crop out at intervals for considerable distances.

* The following matter relative to the rich and comparatively unknown quartz-districts of San Diego County was prepared by Mr. Charles G. Yale, of San Francisco. Mr. Yale is a former resident of the county, familiar with its quartz-interests from the period of their discovery, and has a personal knowledge of the principal mines referred to.—R. W. R.

Since the discovery of the Washington mine, February 22, 1870, a large number of veins have been discovered and prospected. Many of them have been abandoned, although a sufficient number are now worked to make the camp a comparatively lively one.

Banner district.—At first only one district was laid out—Julian—and the principal part of the population resides there yet, at Julian City. About seven months after the first discoveries on the mountains around Julian City, a rich ledge was struck in San Felipe cañon by parties hunting for wild grapes. The ledge was found on the edge of a creek, and both the sands in the creek and the ore from the ledge were found to be rich in gold. This ledge was called the Redman, and was, where found, about 3 feet wide. In a few days after this discovery was made known, the precipitous and chaparral-covered south side of San Felipe cañon was alive with prospectors, and a number of ledges, extending for a distance of three miles, were located; although many were barren, a majority were exceedingly rich in gold, and all the ore was “specimen-rock,” showing free gold in abundance.

A new mining-district was immediately formed and called Banner. It adjoins Julian on the east, and the mountains through which the mineral-belt passes are drained by the south and west tributaries of San Felipe Creek, which flows, through the cañon of the same name, to the desert. The creek lies about 1,400 feet below Julian City, although only about two miles distant. The majority of the mines in this district are situated on the south side of the cañon, about half way up, and the ore is packed on mules down the side of the mountain. The cañon runs out to the Colorado desert, about ten or twelve miles from the mines.

The principal mines now worked in Banner district are the Golden Chariot, Madden, Antelope, Kentuck, Ready Relief, Pacific, Mabel, and Aguardiente. Locations made on ledges which have not been worked to any extent, or which are now temporarily idle, are numerous. Among this class are the Mogul, Don't Bodder Me, Montezuma, Chapparal, Ophir, Hidden Treasure, Romeo, Atlantic Cable, Redman, Hubbard, Poor Man, City of Richmond, Last Chance, Buena Vista, Blue Lead, Trail, and several extensions of the Golden Chariot. On a few of these mines considerable work has been done; and from some, considerable amounts of gold have been taken. Among the latter may be mentioned the Chapparal, Redman, and Blue Lead.

The Madden mine was discovered September 10, 1870. The ledge, at the depth of 80 feet, is 14 inches thick. The rock has been very hard, requiring continuous blasting. The ore worked has averaged \$75 per ton.

The Redman mine was found in August, 1870, being the first discovery in the district. It was thought for some time to be the main ledge of the camp, and was at one time extensively worked. A large amount of bullion has been taken from the mine; but inexperience and financial difficulties have caused operations to be temporarily suspended. A Wilson steam stamp-mill, formerly at Julian, was brought down to the creek near by and the ore worked there. The present owners intend running shortly. The vein-matter has run from 6 to 10 feet in width. The mine was for awhile worked by a tunnel on the ledge in the face of the mountain. A shaft 80 feet deep was also sunk, but the water was so abundant as to require pumping-apparatus, which, with the necessary hoisting-apparatus, the proprietors were unable to purchase. The Ready Relief and Hubbard are southerly extensions of this vein; and the ore of the Kentuck and Madden, on the west, much resembles that of the Redman.

The Ready Relief, which crops boldly on the face of the mountain, was discovered immediately after the Redman, on the south fork of the San Felipe Creek, which divides the two mines. This is better known as the Bailey Brothers' mine. It is in a peculiarly favorable situation for working. A fine stream of water flows by it, which the owners have tapped at some distance above, and, by means of a ditch and small flume, have brought the water to run their 3-stamp mill with an overshot-wheel. The ledge averages from 2 to 8 feet in thickness where it crops out, and shows free gold in nearly all the croppings, from the point of commencement on the level of the creek, to the top of the hill, which rises, at an angle of 40° to it, to the height of about 600 feet. The company has run a tunnel on the lower level, 130 feet, and two other tunnels 40 or 50 feet. These tunnels are run wholly in the vein, and rich ore has been taken from all of them. Ten tons of ore, crushed at the mill, yielded \$980. The claim comprises 1,000 feet.

The Hubbard ledge lies south of the Ready Relief; the croppings are very rich. A tunnel has been run into the hill to within about 40 feet, it is supposed, of the ledge. Want of means has suspended operations for the present.

The Kentuck was found in October, 1870. It is one mile northwest of the Redman. The lode is about 16 inches wide, and the ore has averaged about \$40 per ton. A large amount of dead work has been done on this claim. A shaft has been sunk 80 feet, at which depth the mine looks better than ever.

The Antelope lies northwest of the Kentuck, and contains some fine ore. Some selected rock has been pounded out in a mortar, which has yielded \$4 per pound. Some notion of the richness of this rock may be formed from the fact that the owners pounded out by hand enough to erect an arrastra, and with that (and hand-mortars) got enough gold to buy a fine 5-stamp quartz-mill, engine and all, complete. They began without a dollar and with no knowledge of mining. Ninety feet is the extreme depth to which their shaft has been sunk. This claim comprises 1,200 feet.

The Golden Chariot, discovered in February, 1871, has proved the most productive mine in the district. At 50 feet in depth water was encountered on the 2-foot main ledge, and no drifting has been done below the 50-foot level, although the shaft has been sunk 125 feet, showing ore as rich, if not richer than above. The drift on the 50-foot level has been run 125 feet, out of which most of the ore milled has been taken. A recent crushing of 100 tons of ore from this mine yielded \$23,000, or \$230 per ton. Unlike the other mines in this district, this one is located between the slate and granite. Most of the ore averages about \$200 per ton at the mill. The ore has to be packed in "burros" to Whitney's mill in the cañon, as the wagon-road is not yet completed. The Golden Chariot is a mine of great promise. The ore taken from the lower levels averaged \$230 per ton, while that from above paid about \$190. There are three shafts on this vein, one of which is down 125 feet, and is now going 75 feet deeper. In one drift the breast shows 14 feet of pay-ore. About twenty-five men are regularly worked. One run, of 50 tons, crushed at the mill in October last, yielded \$8,100, or \$162 per ton; 52 tons crushed last August from this mine yielded the sum of \$13,621, or \$257 per ton. The ledge averages about 2 feet in thickness, but varies considerably, as do all in the district. The last ore of which any account has been given, it was estimated would yield \$300 per ton, as it was richer than any previously struck. This mine has paid its own expenses

for development, and a very handsome profit besides, ever since it was opened.

The Atlantic Cable lies several hundred feet northwest of the Redman; the ore contains more sulphurets than any of the lodes in the mineral-belt, with the exception, perhaps, of the Sullivan, several miles from Julian. A small amount of sulphurets is found in nearly all the ore in the two districts. There has been but little work done to develop this mine: thirty tons of ore worked yielded \$40 per ton; the vein was 15 inches wide at the surface.

The Chapparal has yielded some very rich ore, and at one time was thought to be extremely valuable; but the rich ore did not hold out with depth. No work is now doing.

The Mabel is a good-paying mine, situated about a quarter of a mile from Julian district. There are many other locations in the camp which show fine ledges at the surface with free-gold ore, but nothing is worked which will not pay a profit from the top down.

There are three quartz-mills in the district, two steam and one water-power, all wet-crushers with copper plates, and working no pans, settlers, concentrators, or arrastras. One of the mills is a 2-stamp Wilson battery, which is run by a direct application of the steam to the stamp. The charges for milling are from \$7 to \$8 per ton, but money could be made by the mill-men at \$5, in consideration of the abundance of water and the cheapness of fuel and labor.

Julian district.—It was here that the first mines of any account in San Diego County were struck. The first was discovered on February 22, 1870, and called, in honor of the day, the Washington. The prominent mines in the district are the Owens, Helvetia, Good Hope, Van Wert, Hayden, Big Blue, Great Eastern, and others.

The Owens has recently been incorporated, with a capital stock of \$500,000. It is systematically worked, and has paid large dividends for the past eight months. The shaft is down 275 feet, and the first level, 100 feet from the surface, extends east 200 feet, and west 100 feet from the shaft, all in ore that averages at the mill \$20 per ton. The second level leaves the shaft at a depth of 200 feet, and runs east 140 feet, and west 180 feet. The ledge in this level averages 3 feet in width, and has paid at the mill about \$35 per ton. The third level, at a depth of 275 feet, runs east 260 feet, and west 200 feet, and in this the ore has yielded from \$50 to \$75 per ton; a considerable quantity has been milled which yielded \$75 per ton. In the eight months ending January 1, 1873, the sum of \$42,319.50 was taken from 920 tons of ore, with an average of twelve men at work. During this time a good deal of dead work was done in sinking the shaft and running levels. The cost averaged \$26.55 per ton. One run of 109 tons turned out \$8,878.28, and 48 tons were worked that yielded \$3,987.44. The ledge, as now exposed, ranges from 2 to 4 feet in width, averaging 3 feet, and others 2. The mine is owned by six men, and some idea of the value of the lode may be had from the following summary of operations for the past eight months:

920 tons of ore yielded.....	\$42,319 50
Expenses of extraction, milling, &c.....	24,210 25
Net proceeds in eight months.....	18,109 25

A fine set of hoisting-works is now erecting at the mine, with a 25-horse engine. This is the first complete set ever erected in the county. The mine has paid its own expenses from the start, and the prospects for increased richness of ore in the lower level are exceedingly good.

The Helvetia mine has also paid expenses since its accidental discovery by a drunken miner, who lay down with his head upon a boulder, to sleep off his debauch, and found on waking that the boulder was float-quartz, and sprinkled with gold. The mine has yielded some very rich ore. The shaft is down 160 feet, and levels have been run on a vein averaging about $2\frac{1}{2}$ feet, and paying about \$28 per ton. Work is now prosecuted with vigor.

The San Diego is one of the old locations, and, after having lain idle for some time, is again worked with good prospects. Very rich ore came from this ledge at the surface.

Among other mines being worked to some extent at present are the Hayden, Great Eastern, Van Wert, Good Hope, Mammoth, &c.

A large number of locations, half prospected, are lying idle for want of capital, the owners holding on to them in hopes that the success of more fortunate mines may inspire confidence in the country. Among them are the Washington, California, Eagle, Rough and Ready, Sullivan, and many others.

Cuyamaca Mountains.—The Stonewall Jackson mine, belonging to Frary & Farley, lies about eight miles southeast from Julian City, in the Cuyamaca Mountains, and cannot, therefore, properly be noticed as belonging to Julian district. A fine 10 stamp mill is in operation at the mouth of the mine, and arrangements have been made to bring, in pipes, from a lagoon a few hundred yards distant, the supply of water necessary to run it. The mine is worked systematically, and has been very well developed. It is situated in the rolling hills at the base of the mountains, and near the Cuyamaca Valley. At first the ore was hauled to mill in Julian, but the proprietors soon purchased a 5-stamp battery, which they have since increased to 10 stamps. The vein-matter ranges from 10 to 16 feet in width—the latter at the lowest depth. The mill is now run by a 40-horse engine, to which is also attached a small set of hoisting-works. The vein has been in some places 20 feet in width, and yields on an average from \$12 to \$20 per ton throughout. The main shaft is now 150 feet deep, and a level has been run at 130 feet. This ledge has paid from the start, the croppings being rich and the ore increasing in value with depth. The mine appears to be isolated, since no others of value have been found within several miles. Work is now prosecuted with energy, and the mill is kept running to its full capacity. The bullion is the finest in the camp.

Stamp-mills.—The stamp-mills of the county may be recapitulated as follows: Stonewall Jackson, 10 stamps; Defrees & Co., in Julian, 10 stamps; Reynolds & Co., at Julian, 5 stamps; Whitney's Wilson steam stamp-battery in Banner, 2 stamps; the Antelope, in Banner, 5 stamps; and Bailey Brothers, at the Ready Relief mine, (water-power,) 3 stamps.

All the gulches in this belt prospect a little in gold. No placer-mining operations on any large scale have ever been prosecuted, although some work was done with rockers, &c., in the vicinity of the Stonewall Jackson mine and elsewhere. Scarcity of water, and the scarcity and fineness of the gold, defeated profitable work.

Coal.—Coal, reported to be of excellent quality, has recently been found in the vicinity of Temecula, in this county. The seam is said to be about 4 feet wide. The land on which it is located is Government property, and no doubt the neighborhood will be thoroughly prospected. It is about sixty-five miles from the city of San Diego.

There is an abundance of wood and water for quartz-mining in the districts described, although the general impression is that such is not the case. The timber is principally pine and oak, and the highest price

paid at the mills for wood is \$5 per cord. Timbers for shafts, tunnels, &c., are worth 16 cents a foot. At Julian City water is not so plenty as in the cañon, but it has been demonstrated that a sufficient supply can be procured with little trouble. At Defrees's mill pipes have been laid from a number of springs, and water is found on the upper edges of the flat at small depth. The mill is able to run day and night. At Reynolds's mill the water is used over again from the tanks. In the cañon the creek supplies an abundance of water the year round. A saw-mill in the vicinity supplies all the lumber required. The population of Julian City has increased materially of late, and the amount of business done there is considerable. It is next in importance, in the county, to San Diego, and, in fact, before the late railroad excitement in the latter place, was a much more lively town than its rival. The scenery in the mountains around the mines is magnificent. From the top of the Volcan or Big Cuyamaca Mountains, the observer may look out upon the Colorado desert on one side, and the Pacific Ocean on the other. The agricultural lands in the mountains and valleys around the mines are without doubt the finest in the country, as the climate is not so dry as on the coast. Thunder-showers occur occasionally in the summer, and the snows and rains are plentiful in winter, though not so plentiful as to prevent the mines from being worked. It sometimes happens that it is stormy or foggy and disagreeable in Julian City, while in the cañon the sun is shining brightly. Large bands of sheep and cattle are fed in these mountains, so that meat is plentiful and cheap. Many ranches are now cultivated in the vicinity, and the camp is well supplied with vegetables, &c. Wild game is abundant, particularly deer.

The town of Julian City contains two good hotels, a restaurant, a post-office, Wells, Fargo & Co.'s express-office, and a number of stores. The houses are substantially built of frame, and the population is a permanent one.

The bullion-product of these mines is rapidly increasing, though it is difficult to arrive at correct figures. The San Diego Union, in an article on the reports of the county, says the most important item is the bullion from the mines, and gives the product for 1872 at \$488,670; for 1871, at \$175,919; increase, \$312,751.

This increase exceeds all expectation, even of those interested in the mines. Moreover, it is the opinion of Mr. Yale that the figures given are low, since a very great proportion of the bullion is not sent through Wells, Fargo & Co.'s express, from which these returns are probably made, but is carried out of the county by other means.

From the foregoing it will be seen that the mines of San Diego County are more important than many suppose, and that, with more improved milling-appliances and the aid of a little capital, these districts will, in the future, add materially to the bullion-product of the State. No refractory ores have yet been met with; the gold in the quartz is, as a general thing, evenly distributed throughout; no sulphurets appear in the lowest levels of the prominent mines; those mines that were rich at the surface have, whenever developed to any considerable extent, paid regularly in depth. Ledges that pay from \$12 to \$20 per ton, and are 20 feet wide, like the Stonewall Jackson, would be called unusually good anywhere. The Golden Chariot, with its fine 2-foot ledge, and rock that mills from \$190 to \$257 per ton, is still more remarkable. The Owens, which has paid its six owners the sum of \$18,109, over and above expenses, in eight months, is another example full of promise. These three mines are the leading ones at present of San

Diego County, and, as they are more fully developed than any others, and are some distance apart, (the Stonewall Jackson being at the foot of the Cuyamaca Mountains, eight miles from the Owens, and about four from the Golden Chariot,) they give reasonable ground for the expectation that others, equally good, may be hereafter opened. The bullion from all the mines varies considerably. The Banner-district mines, which are low down in the cañon, contain a large proportion of silver. The bullion has sold at the stores from some mines at from \$12 to \$14 per ounce; that from the Julian mines, high up on the mountain, has sold for \$16 per ounce, and Mr. Frary, of the Stonewall Jackson, reports that he sold his bullion at the mint for \$18 an ounce. The miners in the section get \$3 per day, and board themselves.

It is noteworthy that these mining-districts have paid their own way from the commencement—a circumstance not very common in quartz-mining, and one which explains the alternations of enforced idleness, or of discouragement, with active and hopeful work, through which they have passed. It is probable that at one time Julian would have been deserted, but for the fortunate discovery of the Cañon mines, as they are called, in Banner district. There is no fear of another relapse, but every prospect of increasing and permanently prosperous industry.

MARIPOSA COUNTY.

I have received no returns of a trustworthy character from this county, my letters addressed to mine-owners having remained unanswered, and a personal visitation by myself or Mr. Skidmore having been impracticable.

The Mariposa Land and Mining Company—a corporation which has succeeded to the old Mariposa Company in the ownership of the well-known estate of that name—is reported to have consolidated after much trouble all the interests involved, and to be ready for active operations in the mines and mills. Mr. Easton, the new engineer, asserts the discovery of large amounts of good ore standing in the Josephine and Pine Tree mines, and propounds in his report of December 3, 1872, to the company, some theories as to the structure and relations of the veins, which it is unnecessary to criticise here, since the developments of this year will doubtless settle many of the points involved, and illustrate what is of more importance, the merits of the practical arrangements proposed for working. Among the new measures announced is an adit from the Ophir mills on the Merced, such as was long ago recommended by the late Dr. Adelberg.

TUOLUMNE COUNTY.

Sonora,* the county-seat, is a thriving town, containing about 1,300 souls.

By a convention of miners held at Sonora, in 1872, all previous rules and regulations concerning quartz-mining were repealed, and all the smaller districts formerly existing in the county discontinued. The county now comprises but one district with the county-clerk as recorder.

The county has 32 quartz-mills, having in all 360 stamps. Of these, 12 mills, with 158 stamps, were in operation during the whole or part of 1872.

* The summary of the condition of the mining-interest of Tuolumne County is based on the notes of Mr. D. T. Hughes, of Jamestown.—R. W. R.

The Confidence mine, about fourteen miles nearly due east from Sonora, has been one of the most productive in the county. It started with 20 stamps several years ago, and has since increased the number to 40, all of which have been running pretty steadily, with the exception of about two or three months this year, when the mill was idle for the want of ore. Attached to the mill are a Blake's crusher and three arrastras, the whole driven by steam-power, crushing, on an average, about 1,200 tons per month. Weight of stamps, 550 pounds; 6-inch drop, 70 times per minute; discharges through a No. 7 slot-punched screen; amalgamation on copper plates. The sulphurets are concentrated on carpet and blankets, then mixed with salt for the purpose of hastening the oxidation, and afterward amalgamated in the arrastras. The ore is hoisted out of the mine by steam, through an incline 650 feet deep on an angle of 35° , (at and near the bottom only 17° .) The vein varies in thickness from 2 to 16 feet, and carries quartz mostly well filled with seams, rather easily broken, and inclosed in granite. The cost of mining and milling this ore is said to be about \$6.50 per ton. Yield unknown.

The App mine, situated at Quartz Mountain, now owned by Messrs. Griffin & Tolten, is on the mother-vein.* Course nearly north and south; dip of 63° E. The present owners have worked diligently for several years in the development of the mine. The main shaft has now reached the depth of 775 feet. At the depth of 650 feet they struck a chimney of ore from $2\frac{1}{2}$ to 8 feet in thickness, which it is said will yield from \$12 to \$30 per ton in the mill. The quartz carries a small percentage of sulphurets, and is inclosed in hard greenstone on the hanging-wall and talcose slate on the foot-wall. The mill consists of 25 stamps, (self-feeding,) one Blake crusher, and three pans. Weight of stamps, 700 pounds; 9-inch drop, 65 times per minute; discharge through wire-cloth, 40 holes per linear inch; amalgamation done on copper plates. This mill is run by water-power and has been in operation less than one-half the time during this year.

The Heslep mine, also owned by Messrs. Griffin & Tolten, runs nearly parallel with the App, and has nearly the same dip. The two are about 200 feet apart. This mine was formerly worked by a tunnel, but the ore is now brought to the surface by steam-power and let down to the mill by an inclined plane. The shaft is about 250 feet deep, 150 feet below the tunnel. The vein averages from 2 to 8 feet in thickness, having a gouge on the hanging-wall. The ore is quartz and slate, highly charged with auriferous pyrites, with some antimonial sulphides. This vein has a hard greenstone on the foot-wall and slate on the hanging-wall, exactly contrary to the App. This, with other indications, shows very conclusively the country-rock between these two veins to be this hard greenstone, or, perhaps, that the greenstone occupies the central zone of a channel in the slate-formation, the two marginal zones of which are these two veins. This does not specially encourage the belief that they will come together in depth. The Heslep mill has water-power and 15 stamps, (self-feeding,) and amalgamating with copper plates only. Weight of stamps, 700 pounds; 9-inch drop; discharge through a wire-cloth No. 40. The ore is said to yield from \$12 to \$15 per ton. Sulphurets are partly concentrated and saved near the mill.

The Orcutt mine, situated near Jacksonville, is owned by Mr. Orcutt. The ore from this mine is crushed in the App and Wright mills. The vein is small, but has paid well thus far.

* This mine has been described in my report of 1869, and in that of Mr. J. Ross Browne, preceding mine.—R. W. R.

The Spring Gulch mine, situated between the North and Middle Forks of the Tuolumne River, owned by Sherwood & Co., is a new mine and promises to be a productive one. The last run of ore is reported to have yielded over \$40 per ton.

The Excelsior mine, situated at Sugar Pine Creek, is owned by Wright & Co. This is quite an old mine, once very productive, but abandoned for several years, under the impression that the pay-ore was exhausted. But one of the former owners returned and prospected again with very favorable results, on the strength of which a 10-stamp mill was erected last summer. The vein is small.

The Mount Jefferson mine, near Garrote, has a 10-stamp mill, run by steam; worked only part of the time.

The Chandler and Beal mine, situated on the main fork of Tuolumne River, is owned by the parties whose names it bears. There is a rather small vein of hard, bluish quartz, and a 4-stamp mill. The enterprise is worked economically and reported very profitable to the owners.

The Tullock mine, owned by Tullock & Gashweiler, situated on Bear Creek, about eight miles, nearly west of Sonora, is a new mine, and little developed except by the sinking of a shaft now over 200 feet deep on a vein from 3 to 4 feet thick, and reported to carry gold in paying quantities throughout nearly the whole depth. The company has a 5-stamp mill on the claim, used only for crushing samples as the shaft proceeds:

The Knox and Boyle mine, owned by Judge Preston & Co., situated on the slope of Quartz Mountain, is rather a small vein from 12 to 30 inches in width, running nearly north and south, with a dip of 63° E., inclosed in greenstone and slate. Although this vein is a considerable distance east of the mother-vein, the quartz strongly resembles much of the mother-vein. It is hard, with bluish stains, carrying a small percentage of sulphides of antimony and copper, with a little silver. The mill has 10 stamps and two arrastras; amalgamates with copper plates. Some of the tailings are saved and worked in the arrastras. The ore crushed from this vein is said to have yielded nearly \$30 per ton, but for some reason the mill was not much in operation during 1872.

The Santa Maria mine, situated about twenty-five miles from Big Oak Flat, and near the main road leading to Yosemite, has a rather small vein, rich in gold. The mine has been lately sold. A 10-stamp mill is nearly finished.

The Von Tromp mine is situated two and a half miles northeast of Columbia. This vein was discovered several years ago in a hard limestone formation, and a shaft was sunk to the depth of 30 feet, showing the vein from 18 to 20 inches wide, of hard, bluish quartz, intercalated and impregnated in the limestone, without a gouge or even a seam to separate the two. In 1872, a new company bought the claim and continued the shaft to the depth of 70 feet, when they struck through the limestone, penetrating a slate-ledge. At this point the vein increased to more than double its previous width, and acquired well-defined walls. A small 5-stamp mill has just been completed near this shaft. Most of the quartz veins in this section carry more or less galena through the ore; but the Von Tromp vein is remarkably free from all sulphides whatever.

The Patterson mine, owned by William Patterson, is situated near Tuttletown, on one of the main turnpike roads from Sonora to Stockton. This mine, though quite extensive, has escaped the notice of most of the mining experts. It has been worked for nearly fifteen years, but on rather a small scale compared with its real magnitude. The vein is

prominent on the ridges, where the most labor has been performed, and can easily be traced over a large portion of the claim. These ridges rise on a gradual slope to the height of nearly 200 feet above Mormon Gulch, once famous for its very rich placers. Dividing the two ridges is a gulch by means of which the vein is easily opened by short tunnels to the depth of 120 feet. The location has cheap water-power and is accessible from all points. The vein is large, varying in thickness from 4 to over 50 feet, and well defined, with gouges or selvages on both foot and hanging wall. The country-rock is hard slate. The ore is very peculiar, composed of quartz, slate, and solomite or magnesite, blending together all through the vein, and the whole highly charged with auriferous pyrites. The cubes of pyrites are unusually large, and not seldom the gold may be seen inclosed in them; but more frequently a thin coating of gold appears adhering to the surface. A 5 stamp mill of a very old pattern, and unsuitable for work, belongs to the mill. All the amalgamation has been done in this mill by copper plates only. No attempt has ever been made to work the sulphurets which have escaped down the gulches and have been lost, with fully 50 per cent., it is safe to say, of the gold contained in the ore.

The Shawmut mine has been re-opened by a company, which has re-timbered and cleaned up the old shaft, and is reported to have struck good ore.

Among other discoveries made in this county during 1872, may be mentioned a silver-mine, discovered within seven or eight miles of the summit of the Sierra, and near the toll-road leading from Sonora to Mono and Inyo Counties. The vein is 6 feet wide, in granite, and the ore is rather refractory, carrying, besides gold and silver, the sulphides of iron and lead, with a small quantity of zinc-blende. Samples of this ore assay from \$60 to \$140 per ton in gold and silver. This discovery, made in December, 1872, I believe, will probably lead to much prospecting in the spring of 1873.

Gravel-mining.—This industry has not been very thriving in the county the past year, except in two or three claims. At the Rough and Ready claim, owned by McLain & Co., hydraulic mining has been prosecuted, with results reported good.

The Table Mountain Blue Gravel Mining Company (formerly known as the Humbug and New York Companies) has employed a large number of hands, made considerable improvements, and moved a good deal of gravel during the year. Some of the gravel is reported to be rich in gold. This is a drifting claim, and the gravel is crushed in one of Cox's cement-mills.

The Alpha claim adjoins the Humbug claim. This company has recently sunk a slope, struck pay-gravel, and made one washing, which is said to have given a satisfactory yield.

The Omega claim is located below the Alpha. This company has spent considerable money in prospecting Table Mountain, and is now driving a tunnel to strike the channel of the Alpha Company.

Miners' wages in this county range from \$2.50 to \$3 per day; price of water, about 6 cents per inch, miners' measure, and sometimes more; but much of the water is sold at 6 cents and less.

List of quartz-mills in Tuolumne district, Tuolumne County, California. Reported by D. T. Hughes.

Name of mill.	Location.	Owners.	Stamps.	Arrastras.	Power.	Remarks.
Confidence.....	Confidence.....	.....	40	3	Steam ..	Quartz.
Excelsior	Sugar Pine.....	Wright & Co.....	10	.....	do	Quartz.
Orcutt	Near Jacksonville	App & Wright....	4	.....	Water ..	Slate and quartz.
Griffin & Tolten ...	Quartz Mountain	Griffin & Tolten ..	25	.....	do	Quartz, mother lode
Heslep.....	Quartz Mountain	Griffin & Tolten ..	15	.....	do	Quartz and slate, mother-lode.
Spring Gulch	Spring Gulch	Sherwood & Co ...	10	.....	do	Quartz
Chandler & Beal...	South Tuolumne River.	Chandler & Beal..	4	.....	do	Quartz.
Grizzly	North Fork Tuolumne River.	.....	20	.....	Water & steam.	Running on quartz from Lady Washington mine.
Tullock.....	Bear Creek	Gashweiler & Tullock.	5	.....	Water ..	Quartz.
Knox & Boyle.....	Quartz Mountain	Preston & Co.....	10	.....	do	Quartz.
Mount Jefferson ...	Garrote.....	.....	10	.....	Steam ..	

CALAVERAS COUNTY.

Calaveras County belongs to the group of counties described under the general head of "The Southern Mines" in the report for 1872. The mother-lode, running through the county from northwest to southeast, has been extensively worked, with varying results, for many years. Besides this lode, which will always form a basis for extensive mining, there are many outlying districts containing numerous quartz-veins, such as Railroad Flat, West Point, Washington, and Sheep Ranch. A local paper says:

The quartz-mining interest of Calaveras has advanced the past year more than during the whole period previous, since work upon the ledges was commenced. Gravel-mining is also being more extensively and vigorously prosecuted than it had been for two or three years past. It has been found that, with the reduced rates for water now prevalent, a larger percentage of the ground, abandoned years ago, will pay for washing. At several points in the county extensive hydraulics—similar to those in the northern counties—are being opened, and, as the rains set in, operations will be commenced on a large scale. There is a considerable area of mining-ground in this county, yet untouched, that will pay for working, while many claims abandoned in earlier days are being mined with profit to their owners. While it cannot be disputed that the surface-deposits—those that are readily reached without difficulty or expense—are in a great degree exhausted, the permanency of the mines now being developed will more than balance the ephemeral richness of the placers.

Mokelumne Hill.—The Paloma, or Gwin mine, six miles from Mokelumne Hill, is a consolidation of the Paloma and Alexander mines, and is the most thoroughly prospected mine in Calaveras County. The characteristics of the ore are those of the prominent mines on the mother-lode—sulphureted rock and occasionally free gold. The lode is nearly vertical, runs nearly north and south, and is traceable throughout its entire length by prominent croppings.

The south shaft is sunk to a depth of 600 feet, with levels opened both north and south, as follows: At 200 feet a level is run 240 feet north and 150 feet south, and considerable "stoping" done. At 300 feet the north level extends 240 feet, and the south level 150 feet. At 400 feet, levels are run north and south to same extent as on 300-foot level. At 430 feet, levels are run 100 feet north and 200 feet south, the ground between this and the 400-level being stoped out as fast as the drifts are run. This shaft receives the drainage of a great extent of ground, and powerful pumping-machinery has been provided with a view of future de-

velopment. The middle shaft has attained a depth of 200 feet, with levels opened 100 feet north and 40 feet south. This shaft has powerful steam hoisting-works, and will be continued in depth. The north shaft is 350 feet in depth. Two levels have been run, the first at a depth of 200 feet, the second at 300 feet. The first level has been extended 200 feet north and 400 feet south of shaft; the second level (at 300 feet) 100 feet north and 250 feet south. All these shafts are timbered, and are provided with suitable hoisting and pumping machinery, run by steam-power.

The company owns two mills—one of 40 stamps, the other of 24 stamps. The process is amalgamation in battery, blanket-concentration, and chlorination. The mine has so far yielded 50,000 tons of rock, which has averaged about \$8 per ton. The product and average yield have been estimated, as there are no reliable data of the operations of the predecessors of the present owners. The improvements on the property at the present time, including shafts, drifts, hoisting and pumping works, two mills, and buildings, &c., represent an expenditure of about \$250,000.

Between the 500 and 600 foot levels there is an immense body of ore. The 500-foot level has been driven south 290 feet, in first-class ore the entire distance, and the end of the chimney is not yet reached. The shaft between the two levels was sunk through rock that paid \$50 per ton, and the quartz in the bottom of the "sump" is richer than at any other point. The extension of the 500-foot level and the sinking of the shaft have uncovered a mass of rock 900 feet in length by 100 feet in depth—known to be of extraordinary richness—enough to keep the batteries occupied for an unlimited time.

West Point.—This is a quartz-mining town, between the Middle and North Forks of the Mokelumne River, eastward from Mokelumne Hill, sixteen miles by stage-road; its elevation is about 2,800 feet above the sea. The climate is mild; but little snow falls during the winter season. The formation is granite; the lodes are narrow and in most cases rich in gold and sulphurets, and are found to increase in width as they go down to the depth of 100 to 300 feet. Mining and milling at one time seemed to be separate occupations, but of late they work to much better advantage conjointly. This section of country has been worked by Mexicans, who, as a general thing, hunt for rich pockets and those near the surface. They seldom go deeper than 50 feet, and when they find water or blasting-ground they give up the claim and go after new deposits. The developments on the Zacatera mine have established the permanency of the leads in that district. At Mosquito Gulch the San Bruno, Good Hope, and Grasshopper leads, though not large ledges, pay well. At San Andreas the Thorn and Scifford mines are in operation, the former having been bonded for \$80,000. At Angels the "Big mine" and Stickle claims are paying handsomely.

Railroad Flat.—The prospects of the mines in and near Railroad Flat have rapidly improved during the year. The Petticoat has struck the pay-chimney by continued drifting to the north, but the disadvantageous position of the main shaft in relation to this ore-body has much retarded the prosperity of the enterprise.

Meanwhile several mines, but little known a year ago, have developed into first-class properties. Among these are the Wolverine, Sanderson, and Prussian Hill. The Wolverine has a 4-foot ledge at a depth of 250 feet, with rock of exceeding richness.

Washington district.—In this district there are three mills, aggregat-

ing 33 stamps. The principal mine is the Calaveras, the property of a San Francisco company.

The average yield of the Calaveras Company's ore the past year has been \$19.60 per ton; cost of working in mill, \$2 per ton.

The average yield of the Ferguson & Wallace mine has been \$40 per ton; cost of hauling and milling, \$4 per ton; cost of mining, about \$5 per ton.

The yield of rock from the Woods mine, near Indian Creek, has been from \$25 to \$80 per ton; averaging at least \$50. Cost of hauling to mill, \$2.75; of working, \$1.25; total, \$4 per ton.

All the above-mentioned mines are now vigorously worked, with very flattering prospects.

*List of quartz-mills in Washington district, Calaveras County, California.
Reported by W. M. Donnell.*

Calaveras Gold Mining Company's mill, located at Indian Creek; 20 stamps; steam-power; mill run four months. Idle for want of development in mine.

Ferguson & Wallace mill, located at Sheep Ranch; 5 stamps; water-power; nearly all the time at work.

Samuel Wood's mill, located at San Antone Creek; 8 stamps; water-power; 4 stamps idle for want of water.

The above mills were all built in 1871.

Mr. Henry F. Terry, of Mokelumne Hill, one of the United States mineral-surveyors of the county, has kindly furnished the following, in reply to a letter of inquiry:

It is almost impossible to notice other than the most noted improvements in this industry. Almost every claim is improving more or less.

The Heckendorn mine, on Blue Mountain, is re-opened, and a 5-stamp mill erected.

A very lively interest is manifested in the mines near Railroad Flat and West Point. Several old claims have been opened during the year with good results, giving fresh impetus to prospectors.

Among the many paying mines at or near West Point, I may mention the Zacatera and Bartola.

The Woodhouse, in Sandy Gulch, is lying idle, but considered valuable; and a United States patent has been applied for.

The Petticoat, near Railroad Flat, is re-opened with a full complement of men.

The Sanderson mine, a new discovery, also near Railroad Flat, has paid exceedingly well from the commencement.

The Wolverine is showing good results, and the proprietors are erecting a mill, capable of enlargement to 20 stamps.

Operations on the Poor Man are suspended, for reasons known only to its owners. United States patents have been applied for on the Wolverine and the Poor Man.

The San Bruno, near Mosquito Gulch, is considered among the permanent mines of the county.

The Quartz Glen, near Upper Rich Gulch, has been re-opened and put in readiness for working.

The Hudson, lately sold to an English company, located four miles west of San Andreas, is in a flourishing condition; extensive improvements are making, and application for United States patent pending. A mill is erecting.

Work on the Empire Chief, near San Andreas, has been pushed considerably this year.

The Union Gold-Mining claim, three miles south of San Andreas, is considered a good mine, and constantly worked on a small scale.

Scrifard's claim, near San Andreas, has been re-opened with good prospects.

The Madeira, near El Dorado, is considered a permanent mine, and is constantly worked. A new mill has been erected on the premises.

There are several mines at the Sheep Ranch, a few miles southeast of El Dorado, and a small quartz-mill.

A San Francisco company has purchased the Oramento, Enchantress, and Southbank, situated about two miles northeast of Murphy's, and is working them to good advantage. A 20-stamp mill has been built within the last eighteen months.

The Right Bower and Washington, near the last-mentioned mines, are also considered permanent.

The Stickles mine, in Angels Camp, is a well-prospected mine, and is considered among the permanent and paying mines of the county. A new mill is in course of construction.

The Big mine, also in Angels, is considered a permanent institution.

List of quartz-mills in Calaveras County, running in 1872. Reported by Henry F. Terry.

Name of mill.	Location.	Owner.	Stamps.	Power.	Remarks.
Heckendorn	Blue Mountain....	Heckendorn Min- in Co.	5	Water..	Run three months.
Harris	Sandy Gulch.....	A. M. Harris	8	do	Constantly.
Woodhouse	do	do	5	do	Idle during the whole year.
Hope	do	Hope.....	15	do	Nine months.
Lacy	do	A. Lacy	5	do	Eight months.
Vance	Mosquito .....	.....	8	Steam ..	Idle; undergoing repairs.
Thoss	West Point	W. H. Thoss.....	5	Water ..	Ten months.
Hepburn	Railroad Flat	Hepburn & Co	10	Steam ..	Five months; pay re- cently struck in this mine.
Petticoat	do .....	.....	15	do	Seven months.
Clark's	do	W. V. Clark	5	do	Idle during the whole year.
Lewis Bros. & Co..	Near Railroad Flat	Lewis Bros. & Co..	5	do	Erecting; a promising enterprise.
Wolverine	do	S. O. Putnam	10	do	Three months.
Whisky Slide.....	Whisky Slide.....	Whisky Slide Min- ing Co.	10	do	Two months.
Smith's	Near Mokelumne Hill.	Smith	5	Water ..	Eight months.
Gwin's	Lower Rich Gulch	Gwin Mining Co ..	40	Steam ..	Idle the whole year.
Alexander	do	do	24	do	Three months crushing gravel.
Lloyd	San Andreas.....	Lloyd Bros.....	5	Water ..	Erecting.
Hudson	Near San Andreas	S. O. Brown	20	do	Erecting.
Madeira	Near El Dorado...	G. Roderlein	10	do	Idle the whole year.
El Dorado	do	William Irvin.....	5	Steam ..	Ten months.
Oramento.....	Oramento mine ...	G. H. Congdon & Co.	20	do	On mother-lode.
Stickles	Angels	Stickles & Co	10	Water ..	On mother lode.
Big Mill	do	Big Mining Co	30	do	

AMADOR COUNTY.

This county justly ranks as one of the leading quartz-mining counties of the State. There are within its limits thirty-five quartz-mills, with an aggregate of nearly 600 stamps. The most extensive mining enterprises are on the mother-lode, in the vicinity of Jackson, Sutter Creek, and Amador City, but the county contains, aside from these, numerous valuable ledges, to which attention has been attracted during the past year. At no period in the history of mining in this county has the prospect been more cheerful than at present, and it is expected the gold-yield for the coming year will greatly exceed that of the last.

The Pennsylvania, Erie, and Original Amador mines, near Amador City, have been purchased by English capital. From the admirably thorough reports upon these mines, made in September and October, 1872, by J. D. Hague, M. E., of San Francisco, I extract and condense the following descriptions:

The Pennsylvania is an old mine, having been worked during a number of years by various parties. There are now no available records of their operations, and no very definite information can now be obtained concerning the upper portion of the mine. The mine is opened by a single shaft which is said to be located about 300 feet from the south boundary of the property. The length of the claim is stated at 3,900 feet, the greater

portion, therefore, lying north of the present works. The shaft is 620 feet deep, and is sunk on the dip of the veins, at an angle of about 45° .

Above the 320-foot level the work is all old, and is now inaccessible. The vein, as developed in the lower works, presents the following features: It is inclosed in granite. Its course is about N. 55° W., magnetic, or nearly northwest and southeast, true. It dips to the northeast at an angle of about 45° . Its walls are very well defined and regular, showing good indications of permanence. The width of the vein varies from 2 or 3 inches to about 2 feet. It is said to have been about 3 feet wide in some of the stopes recently worked out, but the widest place just now visible is about 18 inches. The seam is filled with quartz, usually highly charged with sulphurets, generally presenting the appearance of high-grade ore. Free gold in coarse grains is frequently visible. The proportion of sulphurets appears from the milling-operations of the last eight months to be between 5 and 6 per cent.

At the date of purchase by the present owners the mine had been opened to the depth of 250 feet; the 520-foot level has since been driven south 297 feet, and north 150 feet. The 420-foot level is 240 feet long north of the shaft, and 251 feet long south of the shaft. The 320-foot level is 272 feet long north, and 125 feet long south of the shaft. These levels, with the stopes between them, are hardly sufficient yet to afford a definite idea of the extent and mode of distribution of the pay-chutes, but there appear to be courses of good and barren ground, which, so far as yet indicated, dip from north to south.

Most of the ground now opened above the 520-foot level has been stoped out, excepting certain portions which are either known or supposed to be too poor to pay. North of the shaft above the 520-foot level there is a block of ground of considerable extent still standing. Some trial-stopings in this ground have been made without very satisfactory results; but it has not yet been thoroughly tested, and it remains to be seen whether or not it may be mined with profit. Some portions of the vein, as shown in the drift, are good-looking but small. At the present moment this block of ground is believed to be the only reserve above the 520-foot level which may supply ore to the mill before new ground is opened, either in depth or length. It appears that during the first half of the present year, while the stopes above the 520-south were furnishing good ore, too little work was done in opening new ground for the future. The result is that it is now impossible to keep the mill fully supplied; and should the ground above the 520-north prove to be too poor to pay, this condition of affairs is likely to last until new resources are developed.

The vein in the shaft below the 520-foot level is looking well, though small; its width varies from about $2\frac{1}{2}$ inches to 15 inches. The new level going south from the bottom of the shaft shows a very small vein. The winze 75 feet south of this shaft was, at date of visit, about 75 feet deep. The average width of the quartz was about 18 inches, and much of it appears to be of very good quality. The hope and reasonable expectations are that when the drift from the shaft is connected with this winze and extended farther to the south, a vein of paying width will be found, and thus a block of good ground be made available for milling. The prospects for the future, therefore, both in the bottom and in the north end of the levels above, are encouraging. The late experience of the mine shows that the vein, though small, carries rich ore which may be mined at a cost affording a handsome margin of profit. From the commencement of operations by the present owners to the 31st of August, there were, according to the records in the office of the company, 2,047 tons of ore mined, and 2,076 $\frac{1}{2}$ tons of ore milled. During this period the expenses have been as follows:

For mining	\$18,168 53
For milling	4,316 47
For bullion-expenses, several expenses, and expenses on gravel-claim	3,216 27
Making a total of	25,701 27

Dividing the total mining and milling items during this period by the number of tons mined and milled, the cost of mining is shown to be \$8.88, and the cost of milling \$2.08 per ton; while including the incidental cost, the sum-total of expense, (diminished by \$1,300 expended on the gravel-claim and not chargeable to the mine,) divided by the number of tons treated, shows a whole cost per ton of \$11.92.* During the period referred to the total bullion-product is shown to be \$56,955.26. Of this sum \$989.94 was derived from the gravel-claim, and is not to be credited to the quartz-mine; this deduction being made, the bullion-product to August 31 is \$55,965.32, equal to a product per ton, including the yield of free gold in the mill and the sulphurets subsequently obtained, of \$26.95, or a profit of about \$15 per ton of ore.

*It is to be noted that this sum does not include the expenses of the San Francisco and London agencies. This sum is also something less than it would have been if a due proportion of prospecting work had been performed during the prosperous months; the result being now that the costs, per ton, must apparently increase.

The mine is well furnished with the necessary appliances for working. The shaft is about 9 feet long by $4\frac{1}{2}$ feet wide in the clear. It is well timbered and provided with hoisting and ladder ways. The rock is hoisted in cars. The shaft is provided with two 6-inch lifting-pumps, one at the 420-foot level and the other at the 520-foot level. Below that point the pump is 4 inches in diameter. The rod, bob, and other working-appliances of the pump are apparently in good condition, and will probably answer the purpose for continued sinking. The water is not very abundant. The pump runs on a 4-foot stroke, making six strokes per minute. The hoisting and pumping machinery at surface comprises two engines, each 10 inches diameter by 20 inches stroke; one for hoisting and the other for pumping. They are so arranged that they can be coupled together, and each one aid or serve as substitute for the other.

The mill is situated near the shaft-house, connected with it by a short tram-road. There is ample room behind the batteries for an ore-dump. The mill has 8 stamps, weighing about 750 pounds each. They are run at a speed of about 60 blows per minute, and drop 9 inches. The mill is old, but is still in fair working order. It is furnished with the usual contrivances for saving the gold. Amalgamation is effected in the battery and on plates outside. The ore, after leaving the plates, is concentrated in ties, washed upon a rocker for the separation of the sulphurets, which are sent to the chlorination-works for treatment, while the mass of tailings are further concentrated on a large buddle. The sulphurets have an average value of about \$110 per ton, and their treatment costs \$22.50 per ton. This gives between \$85 and \$90 per ton net; and as the average proportion of sulphurets per ton of ore has been nearly $5\frac{1}{2}$ per cent., the yield of gold obtained from the sulphurets amounts to about \$4.50, or \$5 per ton of ore. The buddle is worked on shares by tributors, and its product adds somewhat to the yield obtained in the mill. The mill is driven by steam, being furnished with an engine of 8 inches diameter of cylinder by 14 inches stroke.

The Erie mine is near the summit-ridge of a mountain-spur between the north fork and the south fork of Poorman Creek, a tributary of the South Yuba. These streams flow in a general direction from northeast to southwest. The mine is situated on the brow of the hill overlooking their confluence, and the form of the surface is such that, the course of the lode being nearly north and south, the ground falls off steeply in three directions, north, south, and west; while to the northeast it rises gradually toward the more elevated mountain-range. The streams flow in deep cañons, probably over 1,000, perhaps 1,500 feet below the present mine. These conditions afford good opportunities for working the ground by means of adits or tunnels driven in from below, should future developments sufficiently assure the permanent value of the property. Just to the eastward of the present works the ground is nearly level for a considerable distance, giving a favorable site for the requisite buildings, hoisting-works, mill, wood-yards, and other appurtenances.

The mine is at present worked through a single shaft upon the inclination of the vein, or about 67° from the horizon. The shaft is said to be near the center of the property, but is near the south end of its developed portion. It was 250 feet deep in September, on the dip of the vein. At 80 feet and 160 feet, levels have been driven between 200 and 300 feet in length north, and over 100 feet south. Below the second, or 160-foot level, the shaft has been sunk already 90 feet, and further sinking is in progress to open a new level 100 feet below the last.

The mine has been worked during a number of years, and by several different parties, operating generally on a small scale. The greater portion of the ground above the first and second levels north of the shaft, and some of the ground south of the shaft, have been already stoped out. The older stopes are for the most part filled up, and now inaccessible, while the newer stopes, still open, show the vein to possess the following characteristics: a general course of N. 20° W. magnetic, or within a few degrees of due N. and S., and a dip 67° E., both conformable with the general strike and inclination of the inclosing slates. The slates are not very hard, irregularly laminated, and carry many veins and intercalations of quartz. The width of the vein is variable; walls not very well defined. The average width of the stopes is probably about 15 feet. A recent stope above the first level, south of the shaft, is 30 feet wide in places. This lies entirely west of the shaft, while east of the shaft, 20 feet below the first level, a cross-cut has been made 50 feet to the eastward, entirely in quartz. The mass of the vein is a mixture of quartz and slate. In the ground now standing above the second level, which is generally poor, the quantity of slate seems to exceed that of the quartz. Its value in gold cannot be very closely estimated by the eye, but it is generally of a low grade, according to results recently obtained in the mill. The proportion of sulphurets in the quartz is exceedingly small. Below the second level, both in the shaft and in a winze which is now being sunk about 100 feet north, the quartz is better-looking, frequently showing free gold.

The length of vein proved in the present works of the mine is about 290 feet on the first level, and about 220 feet on the second level. When the property came into the hands of its present owners all the work lay north of the shaft. The first level had been driven, it is said, 240 feet north, at which point the vein becomes pinched.

This level is now impassable, and the ground cannot readily be examined. The second level, at the date referred to, had also been driven 140 feet north in the vein, and at that distance the quartz is pinched to a small seam. The level has since been carried on in the eastern country-rock, and, at a point about 90 feet beyond a cross-cut, has been driven westward, cutting what appears to be the wall of the vein, but developing thus far only a narrow seam. This is therefore practically the north end of the present pay-chute, though the vein continues, and should be opened out by drifting either on a second or a lower level, in the expectation of finding a widening out of the ledge, and thus developing a greater length of productive ground.

Under the new management both levels, the 80-foot and the 160-foot, have been driven southward from the shaft. Both passed through a mass of mixed quartz and slate, which afforded a low yield of gold by milling. At about 45 feet from the shaft, on the first level, the quartz abruptly terminated, having been apparently cut off by a dike; and on the second level the same dike was encountered at a distance of 75 feet from the shaft. This dike of eruptive rock has a course about N. 70° W. magnetic, making an angle of about 50° with the course of the vein. Its dip is south at a pretty high angle. Its width, judging from developments under ground, and from appearances on the surface, is only a few feet. Search for the continuation of the vein beyond the dike has not yet been thoroughly made. On both levels a drift has been run on the course of the dike, but not in the regular country-rock of the vein. I am unable to say with certainty whether the dike has occasioned any extensive faulting or displacement of the vein, but such does not appear to be the case at present; and, if the vein is continuous beyond the dike, it will probably be found without much trouble. Whether or not it is continuous remains to be proved. The dike is therefore the present southern limit of the proved quartz-vein, and the pinch on the north, already described, is the present limit in that direction.

Between these limits the developed ground of known value has been, as already stated, chiefly stoped out. North of the shaft, above and along the entire length of the first level, the earlier operators of the mine had stoped away a considerable portion, leaving, however, a large reserve between these stopes and the surface. The present manager has raised stopes along the entire line of this reserve for perhaps 10 or 20 feet, but, unfortunately, the rock yielded so poorly in the mill that the ground was subsequently abandoned. Between the first and second levels north of the shaft were the stopes of the late owners, and from this region came the ore which made an excellent yield during the six months previous to the purchase by the present owners. Some ground in this block, remaining at date of purchase, has since been stoped, affording good returns, but all of known worth in this portion of the mine has now been removed. South of shaft in first level a large stope has been made by the present management. It extends from near the shaft to the southern limits of the quartz, and rises as high toward the surface as it is prudent to go. From this chamber, which has a width of 20 or 30 feet, probably over 2,000, perhaps 2,500, tons of ore have been taken and milled, hardly, if quite, paying the costs of mining and milling.

Below this stope, between the first and second levels, the ground is all standing. This block is practically the only known reserve of unprospected or unimproved value above the second level. Should it be no richer than the stope just above it there would hardly be profit in working it, but, as the vein here is very wide, there may possibly be found a better seam somewhere between the walls of the vein, and in this hope it should be prospected.

The present condition of the mine may be briefly summed up as follows: The length of known vein, limited on the south by a dike and on the north by a pinch, is 290 feet on the first level, and 220 feet on the second, diminishing therefore in depth. Above the second level, between these limits, all the quartz that is now believed to be profitable for working has been stoped out, though large reserves of low-grade quartz remain, and further prospecting may show some portions to be valuable. The hope for the future, therefore, lies in opening new ground below the second level, and in extending the work longitudinally with the purpose of opening up a greater length of ore-ground. The sinking now in progress gives most satisfactory indications of a good vein and profitable quartz. The probabilities are that the shaft and winze will open a block of very good milling-ore.

The hoisting and pumping works are established at the mouth of the shaft, which has a nearly uniform pitch of 67° from the horizon. When complete its dimensions will be 7 feet by 14 feet over all, timbered up with square timbers in three compartments, each about 5 feet by 4 feet. Two of these are designed for hoisting and one for pumping. The rock is hoisted in iron buckets, sliding upon guides. The shaft is provided with an 8-inch lift-pump, which extends to the 160-foot level; and there is already a supply of pipe to reach to the level below. The mine at times is very wet, and of late the water has proved a cause of serious delay in sinking, as the means provided for its removal were insufficient.

The hoisting and pumping machinery is driven by a steam-engine, 14 inches diameter of cylinder, which also drives the stamps; the mill and hoisting-works being un-

der one roof: This arrangement, though well adapted in some respects to a small scale of operations, possesses the disadvantage of making the several departments of the work too closely dependent upon each other. If the pump is driven at the most advantageous speed the stamps run too slowly; and, if an accident causes a stoppage in one department, it is very likely to delay all the rest of the work. The mill has 10 stamps of about 800 pounds each. Their average speed is from 64 to 70 9-inch drops per minute, though they might be run to 80 if disconnected from the other machinery. Their duty in crushing rock varies, but may average $2\frac{1}{2}$ tons per day per head. Amalgamation is effected in the battery and on plates, as usual. The tailings run over blankets for the accumulation of the sulphurets, but these form an inconsiderable proportion of the ore. The costs of mining and milling are comparatively low under the advantages derived from working a large vein of rather soft rock, and from the cheapness of fuel, timber, and other essential materials. Cord-wood costs from \$2.25 to \$2.50 per cord. Labor varies from \$3 to \$3.50 per day. According to the data obtained from the record of operations, the total amount of ore mined by the present company up to August 1 was 3,842 tons, and the whole mining and milling cost of this, including all prospecting and dead work, was \$5.88 per ton. This includes also bullion and general expenses. The average cost of milling alone, during this period, has been about \$1.50 per ton, leaving \$4.38 per ton for all other current costs. As the prospecting and dead work have probably been somewhat in excess of their due proportion under ordinary conditions, this cost may be regarded as a safe indication for the future, if the width, hardness, and ore-producing capacity of the vein remain about as they have been in the past.

As nearly as I could ascertain, the average yield of the rock worked by the late owners, during the five or six months prior to the purchase by the present company, was about \$10 per ton. All or nearly all this rock came from between the first and second levels; and, at the time of the transfer of the property there was a small pillar remaining of similar quality. This was mixed, by the present superintendent, with other rock in the mill while it lasted; and, during the six or seven months of the present year, July inclusive, the highest month's average yield has been \$8.14 per ton, and the lowest \$4.12. The total receipts for this period, divided by the number of tons milled, shows an average yield of \$5.84 per ton of ore.

There would be but small hope for profitable business in the future if there were no prospect of increasing the yield thus far obtained by the present owners. There is, however, much encouragement in the appearance of the ground now being opened below the second level. Should the present indications be found to fairly represent the character of the quartz, the yield should be brought up to the original estimates, say of nine or ten dollars per ton.

This, with an expense of, say, \$6 per ton, (or, when working on a large scale and with increased facilities, a still lower cost than this,) would leave a marginal profit of, say, \$3 per ton or more.

The so-called East Vein has lately been receiving some attention in the way of exploration.

It crops out boldly about 300 feet east of the Erie hoisting-shaft. Its croppings can be traced for a long distance; and they might readily be assumed to belong to the Erie if not carefully observed. They appear, however, to indicate a parallel vein, which, so far as surface-croppings show its character, is large and permanent. Little or nothing is yet known of its value. Some prospects have been obtained from panning the rock from the croppings. At present a pit has been sunk upon it from the surface, and on the second level of the mine, north end, a cross-cut is being run through the country-rock to strike it.

The Original Amador claim covers 1,450 linear feet, while the underground workings extend about 650 feet in a northwesterly direction from the south boundary. The mine is opened by three shafts, which follow nearly the dip of the vein, inclined, say, at from 40° to 70° .

The southernmost of these shafts, 68 feet from the south boundary, 175 feet deep, of small dimensions, was used by the oldest workers of the mine. Of late it has been employed as a pump-shaft, a steam-pump being established at the bottom of it. The middle shaft is 196 feet northwest from the last mentioned, and 48 feet vertically above it on the hill, 356 feet deep on the vein, and is the main working-shaft, though in poor condition for extended operations. The upper shaft is about 133 feet farther north. Its mouth is, say, 17 feet above the mouth of the present working-shaft. It was designed and partly sunk by the recent owners as a new working-shaft, but it is not yet completed. The ground has been excavated from the surface to bottom level of the mine. The ground passed through by these shafts has been opened horizontally by drifts at various levels.

The vein courses northwest and southeast, dips from 40° to 70° , averaging, perhaps, about 55° E. It has a hard, slaty greenstone as a hanging-wall; while the foot-wall is a some-what soft, coal-black, thinly and irregularly laminated slate or shale. The vein has many features in common with those of the celebrated Hayward, Amador, and Key-

stone mines. The last-named mine is a near neighbor on the south of the Original Amador. The vein varies in width from 1 or 2 feet to 20, and perhaps more. It presents two characteristic seams, commonly distinguished as the hanging-wall vein and the foot-wall vein. These may be present together or single.

The hanging-wall vein appears to be usually much the larger of the two. It generally consists of hard, white quartz, frequently mixed with much greenstone, and sometimes joined to the greenstone of the hanging-wall rock, without any gouge or well-defined limit between them. This quartz carries some iron pyrites or sulphurets, usually sparsely distributed in spots and bunches, not often in seams. The general appearance of the hanging-wall quartz now visible is of that low-grade rock.

The foot-wall quartz is usually a narrower vein, inclosed in or associated with the soft black slate. It shows an abundance of clefts and crevices, in which are seams of sulphurets, and sometimes visible free gold. So far as known it has always been much richer than the hanging-wall quartz, and in the old works was stoped out, while the hanging-wall quartz was left, the latter being at that time too poor to pay. As already described, this foot-wall quartz may be associated with the hanging-wall quartz, or it may form isolated bunches, or chutes, or chimneys in the foot-wall slate.

The condition of the mine may be summed up as follows:

1. In the portion of the mine south of the middle shaft, and above the third level, there remains a large quantity of hanging-wall quartz, but with a small exception all the known foot-wall quartz has been removed.

2. North of the same shaft, and above the same level, there may remain good ground, but it is not yet proved.

3. Below the third level, and south of the middle shaft, the vein takes an easterly pitch into the greenstone, so that at the fourth and fifth levels, where it has been reached by cross-cuts, there is a mass of greenstone 50 feet thick intervening between the quartz and the regular foot-wall slate. This greenstone may be regarded as a "horse;" and the probability is that in greater depth it may disappear, and the quartz return again to its true place at the junction of the greenstone and foot-wall slate. The so-called foot-wall vein is almost entirely lacking in this portion of the mine so far as present developments show; and the hope for the future is, that when the bottom of the greenstone-horse is reached the coming in of the quartz in its true place will afford a good foot-wall vein of pay-rock.

4. Below the third level, on the north side of the shaft, there are large bodies of quartz opened, of which the greater portion stands now in reserve. The exact relation of this quartz to the hanging-wall vein found east of the greenstone-horse, further south, is not yet quite clear. It remains to be seen whether the greenstone pinches out, and the two veins come together going north. The indications are that this will take place in depth, since the foot-wall slate in the fifth level is taking a flatter pitch than it has had above. Of the quartz removed from this ground some portions have been excellent in quality, but the mass of it, as indicated by our present data, is of low value.

5. I have made no careful estimate of reserves now standing in the mine, since the present indications are that only a small portion of it, if any, will prove to be worth stoping; and such portion or portions have yet to be determined by special tests. The quantity of quartz is, however, not in question. I think there would be no difficulty in supplying the mill for a long time to come with the quartz now available; but the quality indicated by the crushings, so far, is such as to make an exact estimate of reserves of but little moment.

The yield of the quartz had not been exactly determined by mill-results at the date of my visit, as no complete clean-up had been made. The mill had made a continuous run from about the middle of July until the last of August, crushing, according to the records at the mine, 2,347 tons of quartz. The yield of this rock, obtained from partial clean-ups, is estimated to have been about \$4 per ton.

Since the date of my visit the clean-up for September has been made. The value of the gold is not exactly determined at date of writing, but will exceed \$8,400. The amount of ore crushed was about 1,300 tons, equal to about \$6.50 per ton. The average product thus far obtained would not be far from \$5 per ton.

With regard to this yield it is to be observed, first, that the difficulties of starting a new mill and of obtaining immediately a fair percentage of the value of the ore, are sometimes so great that it would be unwise to base any conclusions on the first results until they are confirmed by longer operation. A variable and sometimes large amount of gold must be absorbed by and remain upon the amalgamating-plates of a new mill, and this item alone may considerably diminish the amount of gold obtained from the first run. Thus Mr. Oliver tells me that in the case of the new Coulter mill at the Sierra Buttes mine, it was only after three months' running that the yield of the rock was equal to that crushed in the other two mills of the company, at work on similar ore. During the first month the difference was \$4 per ton; and subsequently the improvement was gradual, until the yield in the new mill was finally brought up to the average yield in the others.

In the present case the operations of the mill show a gradual improvement. That the yield of the rock, however, will fall far below the estimated value, and probably below the working-costs, is too clearly indicated.

Further, the rock thus far crushed in the new mill has come chiefly from the stopes opened above the fifth level. Only small quantities have come from other points in the mine. None had yet been taken, at the date of my visit, from the immediate vicinity of the larger of the two stopes that furnished the rock for the working-tests made by the recent owners, although some have been crushed from a stope not far below it. I think it quite improbable that this circumstance will furnish the reason for a lower yield than was expected, for, judging of the rock by its appearance, that which has recently been crushed is quite as good as that which remains in the stope referred to; but it still remains to be determined by special tests whether the rock so far crushed fairly represents the average value of the quartz now available in the mine, or whether there are any portions of the mine that may yield a higher grade of ore.

With regard to the wide difference between this yield obtained and that estimated, I have but a simple suggestion to offer, in effect, that, accepting as true the reported milling results on which the estimates were based, it is probable, in the light of our present knowledge, that the yield of the higher-grade rock obtained from the foot-wall chimney, before described, unduly raised the average value of the rock obtained from the larger stope in the hanging-wall quartz, which is of much lower grade.

The working-expenses of the mine during July and August are set forth by detailed statements furnished from the office. The mining-costs are as follows:

	July.	August.
Officials	\$500 00	\$500 00
Extracting ore, (labor and materials).....	3,780 52	1,991 04
Prospecting and dead work	2,037 31	2,452 39
General work	415 28	11 50
Hoisting-works.....	519 00	431 85
	7,252 11	5,386 78

The amount of ore extracted from the mine in July was 802 tons, and in August, 1,178 tons. Taking the figures given above, the total mining-cost (not including milling) was, in July, \$6.71 per ton, and in August, \$6.13 per ton. The amount of prospecting-work applied to the amount of ore extracted, was, in July, \$2.48, and in August, \$1.73 per ton; these sums, subtracted from the foregoing, leave the mining-costs, prospecting deducted, for July, \$4.23, and for August, \$4.40 per ton. It is to be observed that the present unexpected condition of affairs has induced a considerable outlay for prospecting; and this, when applied to the amount of ore extracted, considerably increases the mining-costs per ton. The cost for extraction, moreover, while applied only to the amount of ore hoisted, really covers the cost of breaking a large amount of rock remaining in the mine, and yet to be raised. The superintendent estimates 1,500 tons as broken in the mine and ready for hoisting. This, of course, unduly raises the mining-cost for the period of time in question.

The current costs of working will depend largely upon the relation which the outlay of prospecting and dead work will bear to the cost of actual extraction. If the quartz now open and available in the mine were to be stoped out, or if the ground to be opened in future should present as favorable conditions for working as that now opened, the expenses ought not to exceed much, if at all, the estimates made at the time of the purchase of the property, say \$6 per ton for mining and milling. If, however, the hanging-wall quartz in deeper workings should remain too poor to pay, and the work in the mine should thus be restricted to what might be found of the narrower seams or smaller chutes of foot-wall quartz, the cost of working must necessarily be increased.

The mine is at present furnished with hoisting-works located at the mouth of the middle shaft. These comprise an engine, 12 inches diameter of cylinder, with one steam-boiler and two winding-reels. The shaft is fitted for hoisting with two iron buckets of 1,000 pounds capacity each. The shaft is in rather poor condition, having been sunk at various angles, which make it inconvenient for hoisting. The water is removed from the south shaft by means of a steam-pump; from the bottom of the middle shaft it is taken out by a bucket. The hoisting-works at the middle shaft are inclosed by a suitable shaft-house built of wood, connected with which is a smith's shop. The mill is located between the middle and the north shafts. It is connected with the former by a short trestle-work, so that the cars having received their load of rock from the bucket are moved into the mill and deliver their charge at the rock-breaker. The mill is furnished with one rock-breaker, which prepares the rock for the stamps. There are 40 stamps, each said to weigh 750 pounds, making 78 blows per minute, dropping about 8 inches. Judging from their work thus far their capacity will be about a ton and a half per head per day. Amalgamation is effected in the battery, and each battery is provided with an apron or table covered with an amalgamated-copper plate,

over which the crushed material passes, and thence on to blanket-tables about 20 feet in length. The blankets are washed every half hour and the accumulated sulphurets and concentrated ore are ground in a pan for six hours. That which passes away from the blankets escapes from the mill, and is subject to no further treatment. The sulphurets having been ground in a pan are reserved for further concentration. Percussion-tables are now being constructed in the mills for their treatment. The operation of the mill appears to be generally satisfactory. I caused a series of assays to be made of the tailings escaping from the mill. The results varied from \$2.50 to \$3.26 per ton. This value might perhaps be diminished somewhat, though not much, by additional appliances for saving the gold, but it clearly indicates that the difference between the yield expected and that obtained is not to be accounted for by imperfect milling.

The power for driving the mill consists of a steam-engine, 18 inches diameter of cylinder, by 42 inches stroke. Steam is furnished by two boilers set separately in brick-work. This machinery appears to be well established and adapted to its purpose. It has been provided under the new management, as the turbine originally placed in the mill proved to be inefficient. Since the mill started in the middle of July the steam-power has been working satisfactorily.

The costs for milling in July were.....	\$1,594 78
And in August	3,601 69
Making a total of.....	<u>5,196 47</u>

	Tons.
The amount of ore crushed in July was	847
And in August	1,500
Or in all	<u>2,347</u>

The cost per ton in July, therefore, was.....	\$1 88
And in August	2 40
Or an average of.....	2 21

This cost may be decreased if, under more favorable conditions or with softer rock, the monthly duty of the mill should be increased, as may be the case.

On a foregoing page the total costs for mining in August, per ton of rock extracted, were shown to be.....	\$6 13
Deducting the cost of prospecting per ton	1 73

We have as ordinary mining cost.....	<u>4 40</u>
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As this is said to have included some other extraordinary expenses this sum might be still further diminished, and we may probably take as a minimum cost per ton	\$3 75
And allowing a milling-cost of	2 25

We have as a minimum of working-expense under any probable conditions	6 00
The yield per ton according to present data is.....	5 00

And this leaves a net loss per ton of	1 00
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In the same vicinity the Keystone has yielded from \$35,000 to \$40,000 per month during the greater part of the year.

At Plymouth, the Phoenix mine is being developed into one of the most valuable mines in the county. At the present depth of the main shaft, 500 feet, the ledge has attained the width of 20 feet without defining its full extent, and the whole of the ledge ranging from \$10 to \$100 per ton. A 40-stamp mill in connection with the mine is now being erected with the most approved appliances for saving gold and sulphurets.

The Alpine, a continuation of the Phoenix on the north, at a depth of 300 feet is turning out excellent rock, and gives every assurance that it is a valuable mine.

Near Jackson, the Kennedy is fast assuming its position among the most valuable mines in the county; the average yield of the last crushing reached \$24 per ton, and the rock increases in value and quantity as greater depths are gained. A fine shaft, with powerful hoisting-works, is sinking southwest of the old shaft, to strike the ledge at a depth of 400 feet. The mill is running constantly from rock supplied through the old shaft, from the first and second levels, yielding from \$15,000 to \$20,000 per month. A new 40-stamp mill will be erected early in 1873.

The Amador, Oneida, and other mines near Sutter Creek, are yielding large returns. The former, better known as the "Hayward" mine, has been disincorporated preparatory to its transfer to English purchasers. With the completion of the Sutter Canal, of which but a few miles are now unfinished, the expenses of milling will be materially reduced, as it will yield an abundant and unfailing water-supply for power throughout the year, even in the driest seasons.

A rich discovery was made recently on the 270-foot level of the Bunker Hill mine, extending up to the 170-foot level. The rock is well charged with free gold, and very rich in sulphurets, paying from \$50 to \$75 per ton.

Work on the Summit mine is progressing, and the main shaft has been put down 360 feet. From present indications the lead will be reached soon. The hoisting-works, machinery, and in fact everything about the mine is new and first quality.

East of Jackson is the State of Maine mine, which as far as the ledge has been sunk upon gives evidence of permanent value. A fine water-power mill connected with the mine has recently been completed.

The Marklee mine, situated north of Volcano, is doing better from the number of stamps employed than, perhaps, any mine in the county. The Marklee, and other mines in this vicinity, establish the fact that rich gold-bearing ledges exist in the county outside of the Amador belt.

In addition to the quartz-resources of Amador County, it contains a large area of unworked placer-ground, which will afford profitable employment to hundreds of men as soon as water can be had. The great want of the county is water; but this will, ere long, be supplied by the completion of the Sutter Canal. When that event shall take place, a new impetus will be given to every industrial pursuit in the county, besides opening up new branches of labor and business, adding largely to its population and wealth.

Mr. Skidmore informs me that, out of thirty-two circulars and mill-blanks sent to Amador County, addressed to the various mine owners and superintendents, not one reply was received, and no blanks were returned.

EL DORADO COUNTY.

This county, noted as the locality of the discovery of gold in California, is situated between the Cosumnes River and the Middle Fork of the American. For a number of years after the exhaustion of the surface-placers, the decline in population and wealth here was more marked than in any other portion of the gold-region. In 1861-'62, during the wild quartz-excitement prevailing in the State, the numerous veins exposed on the surface attracted the attention of speculators, who formed incorporations for the purpose of selling the stock rather than for the development of the mines. With the collapse of this excitement, El Dorado acquired an unenviable reputation as a mining-field, which it

has taken years to outlive. Within the past two years, however, attention has been drawn to her extensive fields of auriferous dirt, her peculiar "seam-diggings," and her rich ledges of gold-bearing quartz. The result has been that her old-time prosperity is returning, quartz-mines have been opened, and vast enterprises are in progress for the purpose of bringing water in abundance on the deposits of auriferous ground which extend from the lava-capping of the high Sierras to the vine-clad foot-hills on the border of the Sacramento Valley. Two of these, of more than ordinary magnitude, will be briefly noticed.

The California Water Company, of San Francisco, has undertaken a system of works for the supply of the country between the Middle and South Forks of the American River, at a cost which it is estimated will not be less than \$250,000. From a system of lakes and of natural streams rising on the western slopes of the Sierras, at an elevation of 6,000 feet above sea-level, a series of ditches, flumes, tunnels, and iron pipes will convey 4,000 to 5,000 inches of water down the various ridges through the auriferous region to the foot-hills of the Sacramento Valley, thus supplying an area of about two hundred and forty square miles, the greater portion of which contains gravel and auriferous dirt in paying quantities. The entire length of the ditches, flumes, &c., will not be less than two hundred miles. Where practicable, iron pipe, 22 inches in diameter, made from No. 12 and No. 16 iron, will be used. The iron is cut in 2-foot plates, bent by machinery and strongly riveted. When thus prepared in 18-foot sections, it is ready for use, and is buried 2 feet deep in trenches cut for the purpose along the line of the ridges selected, after careful surveys, as the most practicable routes. At one point, crossing the head of Greenwood Valley, one continuous mile of this main pipe will be laid, overcoming a mean depression of 330 feet in crossing the valley. By the use of extensive reservoirs and high dams near the supply-head, the water will be rendered available throughout the entire year, even in the driest seasons. This company owns large and valuable mining-interests also.

The Mount Gregory Water Company is engaged in a like undertaking, but of less magnitude. Its operations are fully described in Mr. Fairchild's paper, given below. It is believed that all the water furnished by both companies will be in demand within a few years. The contemplated water-rates will be 10 cents for ten hours, per miners' inch.

The lower portion of the county (from the valley to an elevation of 3,000 feet) is traversed from north to south by several distinct belts of auriferous ground, generally running in ridges between the Middle Fork and the South Fork of the American. These belts are respectively ten or twelve miles in length, and from one to two miles in width, with strips of non-auriferous ground lying between them. The general appearance of the gold-bearing portions of the country differs from that of the country (in Placer County) north of the Middle Fork; here there exist little or no cemented gravel and no indications of channels or "dead rivers." The "channels" of Placer County probably entered the county higher up, in the region described by Mr. Fairchild, and the distribution of gold in the lower portion is probably owing to the distribution of the contents of these higher channels. These belts or ridges are underlaid by vertically-tilted slates, sometimes highly metamorphosed, permeated in all directions by seams and small intercalated veins of quartz, and heavy "reefs" of siliceous sands. This strange formation constitutes the "seam-diggings," the most interesting features of which are exposed at Georgia Slide and Spanish Dry Diggings. The seams run in all

directions, sometimes uniting and again scattering, but not giving promise of uniting in compact ledges, though such is the popular theory of the miner. They probably continue in this form as far down as the fractures in the slate have permitted the process of infiltration. This formation is worked most advantageously by the hydraulic process, assisted by blasting and picking. The gold does not seem to have been precipitated in the seams in the same way, as in quartz-ledges, but rather to have been brought in by the water when the seams were filled by infiltration. It is therefore generally found in the interstices between the quartz and slate, and is readily released by water, though in some instances small mills have been advantageously employed in crushing the quartz.

The strong ledges of this part of the county are on the borders of a belt of greenstone, and present all the characteristics of regular lodes. Of this class there are many promising mines, but their development is so limited as not to require special mention. Only a few, in an advanced stage of working, will be noticed.

The Saint Lawrence mine, justly considered one of the most valuable quartz-mines in California, is situated in Kelsey district, seven miles south of Georgetown, and is the property of H. P. McNevin, J. C. Bateman, and David Buell, by whom it was purchased, in a partially developed condition, a few years since, for \$15,000. At that time but one level had been started, and the rock yielded from \$10 to \$12 per ton. At the time of the purchase much "dead work" had been done on a tunnel, which the owners, who were poor men, were unable to complete. Under the present proprietors this tunnel was carried on a total length of 400 feet, and the ledge struck at a depth of 115 feet. The tunnel is now used for purposes of drainage, and forms a valuable adjunct to the working of the mine. McNevin & Co., on their acquisition of the property, proceeded vigorously with its development, by sinking the shaft, with such encouraging results that they felt warranted in purchasing the adjacent ground, and acquired further, by location, a total length of 8,600 feet of ground. Within these limits it is reasonable to suppose, from surface-development at various points, that other chimneys or pay-zones exist besides the one now being worked. The sinking of the shaft was attended with the most marked success—the ledge widening from 2 feet, at a depth of 68 feet, to 8 feet 6 inches, at present lowest level found, 400 feet in depth, and the length of the paying-zone steadily increasing as each successive level was opened. At first level, 115 feet from surface, the pay-rock extended 105 feet; 200-foot level, 143 feet; 300-foot level, 210 feet had been opened in October, 1872, without limits of pay-rock being reached—the ledge widening toward the south, carrying at face of drift 8 feet of "pay." Since then the 400-level has been started, and main shaft carried down to a depth of 500 feet. A remarkable feature has been the steady increase of yield of the quartz, from \$10 to \$12 per ton for first 100 feet to \$30 to \$35 per ton between the third level and bottom of shaft. The course of the ledge is nearly north and south, and its dip 45° to the east. The foot-wall preserves the smoothness and polish of all large veins in this formation, while the hanging-wall is not so regular. A strong "gouge" of black talcose slate, often 6 or 8 inches in thickness, accompanies the hanging-wall, greatly facilitating the extraction of quartz. The country-rock is slate and greenstone; the quartz, of the blue, laminated description, rarely shows free gold, carries about 1 per cent. of sulphurets, the latter yielding from \$300 to \$500 per ton at the Nevada City Chlorination-Works, where they are sent for treatment pending the

erection of suitable works at the mine. The mine has powerful steam hoisting-works, with sufficient power to open the ground to a depth of 1,000 feet. The incline, $12\frac{1}{2}$ feet in width by $4\frac{1}{2}$ feet in height, is provided with double track and improved cars, and substantially timbered throughout. The mill has four batteries of 5 stamps each; weight of stamps, 700 pounds; drop, 8 inches; power, steam; system of reduction, amalgamation in battery, copper plates, blanket-washing, and four Handy concentrators; capacity, 30 tons per twenty-four hours. It has been run constantly since its erection. The mine is nearly free from water, and is worked with great economy, not more than thirty miners being employed in the extraction of ore and the sinking of shaft.

The *Cedarberg mine* is situated about ten miles north of the Saint Lawrence, and is supposed by some to be on the same ledge, though this will remain a subject of doubt until demonstrated by further development in the country between the two mines. This mine, situated on the north slope of a range overlooking the Middle Fork of the American River, about 1,000 feet above the river, was discovered and located, in 1868, by John A. Cedarberg, an indefatigable prospector, who, finding rich float-rock in a ravine, near the river's banks, followed it up the mountain-side until he discovered the croppings of the ledge. The most remarkable feature of the mine has been its enormous product of singularly rich specimens of foliated gold.* This character of rock is found on the hanging-wall in a seam varying in thickness from 2 to 4 inches, and has so far continued in depth to lowest workings, and in length as far as the levels are opened. The mine was purchased and incorporated in 1872, the purchase-price being \$12,000, a sum evidently far below its value. During the last quarter of 1872 it has paid the present owners \$36,000 in dividends, with every prospect of a large and continuous yield for 1873. The gold-bearing quartz, from which these large dividends have been mainly paid, is crushed in a hand-mortar, or is sold intact as specimens; but the company, on running a tunnel to strike the ledge below the croppings, cut five separate, well-defined veins of low-grade quartz, separated by sulphureted slates, which induced them to put up a 10-stamp mill. The hanging-wall is defined but irregular, dipping about 70° E. The course, as of all veins in the county, is nearly north and south, and the formations greenstone and slate. At the close of 1872 no levels had been run below 100 feet from surface, but a permanent shaft with hoisting-works was sinking for deep work. It is expected that the veins cut in the tunnel will unite on the hanging-wall to a strong ledge, though perhaps the peculiar rich seam which gave the mine its notoriety may be shut off.

The *Sliger mine*, also noted for the richness and amount of its "specimen" rock, is about one mile north of the Cedarberg, on the same course, though lower down and nearer the river. This ledge was discovered in 1864, and is the property of practical men, who, profiting by the experience of the former owners of the Saint Lawrence and Cedarberg, do not intend that it shall pass from their hands for a mere pittance. They are said to have refused \$100,000 for it. A tunnel has been started which, at 400 feet, will strike the ledge 200 feet below the croppings. The gold here is of a different character from that of the Cedarberg, and may be characterized as "grain" gold to distinguish it from the "leaf"-like production of the latter. It is also more generally diffused throughout the rock, and occurs in wider streaks. The ledge has an average width of 5 feet, though occasionally "pinching," when

* A collection of these was exhibited last winter in the Capitol at Washington.—R. W. R.

the rock becomes richer. The quartz has a more bluish color, and is laminated in ribbon-like bands. The average quartz, not of the "specimen" character, is also of better appearance, and will probably pay a large profit for reduction. The company owns a 5-stamp mill, but which is entirely inadequate for their purposes, and will be replaced by new and improved machinery on the completion of the tunnel. Meanwhile, as in the case of the Cedarberg, the specimen rock is reduced by hand, sold to jewelers as ornaments, or sent to the refining-works at San Francisco, where its value is determined by specific gravity. A shaft is sinking to connect with the tunnel and with a prospecting-tunnel run nearer the surface, on the ledge.

Between the two last-named mines are several others of less note, but of great promise, and apparently on the same ledge. Among these the Atlantic and Pacific has made the greatest development, having attained a depth of 130 feet.

I am indebted to Mr. M. D. Fairchild, of Georgetown, for the material of the following interesting description of the northern and eastern portions of this county, and for some remarks on the southeastern part of Placer County.

The portions of El Dorado County spoken of lie between the Middle and South Forks of the American River, and include the townships of Greenwood, Kelsey, and Georgetown, and the villages of Georgetown, (the largest,) Greenwood, Centerville, Saint Lawrenceburgh, Spanish Dry Diggings, Johntown, Volcanoville, Kelsey, and others of lesser note, comprising an area of not less than one hundred square miles. This territory is in close proximity to Coloma, the site of the old Sutter mill, where Marshall made his celebrated discovery of gold, and, in consequence, it was early populated, and made, for a time, so productive a mining-field as to gain for El Dorado the distinction of being the second county of the State. About 1855-'56, two small ditches were constructed, the capacity of one being, perhaps, 300 inches, and of the other 500, by which the mines were supplied with water. Of course this amount was only sufficient to conduct mining operations upon a primitive basis, and as a consequence the population has dwindled in proportion as the shallow placers have become exhausted. As the people left this region, stockholder after stockholder in the ditches above mentioned disposed of his interest therein, until the principal ownership was vested in a single individual. Much complaint has been made of the policy pursued by him, into which it is not necessary to enter here. It is enough to say that the gold-product dwindled to a nominal sum, and that, in the very center of an extensive and promising mining-region, the ditches were allowed to get out of repair, and the water so much needed, abundant at the source of supply, was allowed to flow past the placers, undirected and unused. Other water-projects were discouraged by fears of litigation; and the franchise thus held, instead of being a public benefit, as all canal systems really should be, degenerated into a public nuisance. But within the past year this has been changed. The old ditch property has passed into other hands; a new and capacious canal has been completed by a new company, monopoly no longer holds sway, and a prosperous era is dawning. The principal owner of the old canals disposed of his right for \$185,000 to the Pilot Creek Water Company, of San Francisco, which has, during the past year, been energetically reconstructing the property purchased, enlarging the capacity of the main canal, building reservoirs, &c.

The new (Mount Gregory) company, mentioned in a preceding page, has a ditch below that of the Pilot Creek Water Company, and reach-

ing, at present, only from Pilot Creek to Mount Gregory Ridge, a distance of thirteen miles, with a fall of about 11 feet per mile. It is 6 feet wide at the top, 4 at the bottom, and 3 feet deep. The company, however, is engaged now, in accordance with its original plan, in extending the canal from Pilot Creek to the South Fork of the Middle Fork of the American River, a distance of thirty miles, it being found that Pilot Creek would not afford a full head for a ditch of that capacity for more than six months a year. Where the canal taps the South Fork there is an abundance of water the year round, and it is not unlikely that the Mount Gregory Company will hereafter increase the size of its ditch. At the head of this ditch the river is so nearly level that a dam 60 feet high will create in the bed of the stream a lake fully one mile long by a fourth to three-fourths of a mile wide, thus furnishing a capacious reservoir (should one be needed) lying in the natural outlet to an immense watershed twenty miles in length, and thus, practically, inexhaustible. It is thus shown that the dividing ridge between the Middle and South Forks of the American River can and will be abundantly supplied with water for mining.

The largest continuous body of auriferous drift in the section referred to is upon Mount Gregory Ridge, bordering the southern bank of the Middle Fork of the American. At its eastern extremity is a ridge known as Tunnel Hill, much higher than the surrounding mountains, running north and south, and cutting in twain the lateral "divides" running west from the main Sierra. Immediately at the base of this hill the gravel-deposits begin; lateral east and west ridges again shoot out, and the head branches of many streams, as Missouri Cañon, Otter Creek, Cañon Creek, and others, are formed from springs issuing from its side.

The depth of the drift varies from a few feet to about 300, and, except where it is quite shallow upon the exposed points, jutting toward the river and the cañons, the auriferous strata are covered with a heavy body of volcanic mud, the "gray cement" of the miners. The width of the gravel-deposit upon Mount Gregory Ridge is about three-fourths of a mile, and its length fully six miles. This vast body of auriferous *débris* is comparatively untouched. At intervals it has been prospected by shafts and tunnels, and in a few places the edges have been tested by the primitive hydraulic operator, with scanty water-supply. These exploitations, as a general thing made years ago, when the price of both labor and water was high, if they did not then induce extended workings, have so exposed the strata as to render prospecting quite easy; and tests have determined that they may become remunerative under the modern hydraulic treatment, with improved appliances and adequate head of water. Near the central part of the deposit the bank has been exposed upon both sides of the ridge. Upon the southern side, where Missouri Cañon affords a fine depository for tailings, the claim of Messrs Bowman & Worthingham, and upon the northern side the claims of Bitters & Co., and the Mount Gregory Water and Mining Company afford the best exposures. The gold-bearing earth in the former is about 50 feet deep, lying in two strata and overlain with 30 feet of volcanic mud. An area of bed-rock has here been uncovered, about 50 by 100 feet. Work was suspended three years ago from lack of water. The average yield of the gravel was about one dollar per cubic yard. The gravel is mainly quartz, and contains many large, smooth boulders, of half a ton weight. The claim covers, perhaps, 20 acres, and with sufficient water it will produce a large amount of gold. Adjoining this claim upon the west, the Mount Gregory Water and Mining Company has a

continuous body of ground, similar in all characteristics, of one mile in length. Upon this side of the channel there is much coarse gold in nuggets, weighing from a pennyweight to two ounces.

On the northern side of the ridge the bank is precipitous, and the Middle Fork of the American here finds its bed, 1,500 feet below the rim-rock of the channel, affording unequal facilities for hydraulicking, the arrangement of tail-sluiques, under-currents, &c. The claim of Bitters & Co., of 2,500 feet, and that of the Mount Gregory Water and Mining Company, of 1,000 feet frontage on the river, expose in slight workings the character of the drift. In the Bitters ground there is no exposure of more than 40 feet, but the gravel is all gold-bearing, the "color" being obtained in nearly each panful of dirt washed, while it has not been worked far enough toward the center of the ridge to encounter the overlying volcanic stratum. This gravel does not contain so much quartz as on the southern side, nor are the boulders so large. The gold occurs in minuter particles. The material is not hard to wash, and would melt before a hydraulic pipe very rapidly. A pressure of nearly 400 feet could be obtained here; but only a very small head has been heretofore employed. The bank, at its greatest depth, must be nearly 380 feet deep; it is shallow only upon the extreme verge of the rim-rock. Its yield per cubic yard has been probably about 40 cents. The ground adjoining this upon the west, purchased by the Mount Gregory Water and Mining Company, was worked considerably, many years ago, with a small hydraulic. The bank exposed shows three strata of auriferous gravel, alternating with sedimentary deposits a few feet thick, and the whole overlain with volcanic mud. The aggregate thickness of the gold-bearing strata is about 35 feet. Though the portion exposed is not as easily "piped" as that disclosed on the face of the Bitters claim, it is, nevertheless, not invulnerable against attack by hydraulic force. The entire body of gravel "prospects to the pan," each panful generally yielding several good-sized scales of gold, besides numerous infinitesimal particles. It will probably produce nearly 60 cents per cubic yard.

Toward the west, down the ridge, are four or five "drift"-claims—diggings which properly should be worked by hydraulic power, but from which, in the absence of water, the owners are constrained to extract a portion of the lower stratum of gravel and wash it as rain occurs. The dirt so drifted out and washed will probably average \$2 a car-load, the box of the car being about $2\frac{1}{2}$ feet wide, 5 feet long, and $1\frac{1}{2}$ feet deep. The most extensively worked of these "drift"-claims is upon the extreme end of the Mount Gregory Ridge channel at its embouchure into the Middle Fork. It is upon a knoll called Buckeye Hill, isolated from the main channel by a reef of serpentine rock, which here crosses the country, while the gravel-banks have mostly been precipitated toward the river below, leaving an intervening crescent of smooth rock. There are, perhaps, 40 acres covered by this gravel-deposit, 20 of which are included in the claim of A. W. Flora & Brother. These gentlemen have perseveringly worked here for many years, each season drifting out what dirt they could wash with the sparse amount of water they were able to procure, and waiting for a time when a regular supply would enable them to operate with hydraulic apparatus. The amount of dirt thus drifted and washed each year varies from 1,000 to 1,500 car-loads, which has thus far produced an average of \$2.50 per load. Their sluicing capacity is not great, a few lengths of small boxes being deemed sufficient. Yet, by this primitive, and undoubtedly wasteful method, over \$40,000 has been produced from the claim. The drift-channel has been

prospected 950 feet from east to west for a width of 100 feet. It is supposed to be at least 200 feet wider. An attempt was once made to hydraulic the bank with 40 inches of water. That was in the better days of the Pilot Creek ditch, and this amount of water (which, later, could not be obtained) was found inadequate, though the operation was remunerative to the miners. By this hydraulic operation, the bank has been exposed on the west to the depth of 130 feet, showing several strata of gold-bearing gravel, alternating with sediment, precisely as described above in the claim of the Mount Gregory Company, adjoining the Bitters ground. It is estimated that the extreme depth of the deposit in the center of the hill is 240 feet. All the different strata, beside the volcanic mud and sedimentary strata, are found to contain gold in appreciable quantities, but the lower stratum only has been drifted upon. This has been exploited with reference rather to the convenience and facility of handling than to its richness or the pursuit of a systematic method of mining. The gravel has been taken out in thickness from 6 to 15 feet only; the chambers and galleries of the mine still exhibit, above, and on either hand, the immense bed of auriferous dirt, from every panful of which a fine "prospect" can be washed. In 1871, from about 1,200 car-loads of dirt, 320 ounces of gold were cleaned up. In 1872 the value of the gold taken out exceeded \$3,000. These amounts represent the labor of two or three men who are doing little else than prospecting the ground, and who work but a small portion of the year.

The area of deep gravel-mines upon Mount Gregory Ridge is not less than four square miles. Upon the outer edges of the drift-channels the shallow placers have been exceedingly productive. The bed-rock is metamorphic slate, through which run many quartz-seams or small veins, some of which are rich in gold. A few have been opened, and a 10-stamp mill is now running upon ore taken from a vein near Volcanoville, a town upon the ridge. This quartz-mine is owned by Messrs. McKusick, Thomas & Jackson, and the rock yields about \$13 per ton. Across the Middle Fork of the American from this ridge are the towns of Michigan Bluff, Sarahsville, and Forest Hill, all apparently located upon the gravel beds of the same age.

At the eastern extremity of Mount Gregory Ridge, two more distinct gravel-channels, coming from the south, intersect it at right angles. The first of these is perhaps one mile square, with an average depth of about 40 feet, and was prospected many years ago with both tunnel and shaft; but it was never worked to any extent, being situated so high up toward the source of the cañons through which it finds drainage that difficulty is experienced in getting the required fall for tailings. Moreover, the lack of water previously spoken of has prevented the working of this ground. It can be opened upon the Middle Fork hill-side and made remunerative, as the gravel almost invariably shows gold in panning, and some that has been drifted out in several localities has been found rich. But the most extensive of these drift-channels is one which intersects the main ridge near the claim of Bowman & Worthingham. Its average width is nearly one mile, and its greatest depth about 200 feet. In length it is fully three miles. There are several openings upon it where hydraulicking upon a small scale has been carried on many years, that is, for a few months in each year, when water could be obtained by small ditches from the adjacent cañons. It crosses three branches of Otter Creek, where they flow through deep gorges, upon each bank of which the exposure of gravel has been made. The bottom stratum is principally quartz-gravel and sand, in some places covered with volcanic mud, and in others denuded of all but a few feet of reddish loam. In

some of the openings immense boulders of quartz are found, washed smooth as any pebble; some of which weigh over 25 tons. Large nuggets of gold are found occasionally in this channel. The principal openings upon the channel are near the center, at Kentucky Flat, tailing into the northern branch of Otter Creek, and upon its extreme southern end, at Tipton Hill, where the sluices tail into Rock Creek, a tributary of the South Fork of the American. Fully three square miles are covered by this deposit; and its gold-producing capacity can be judged by the following statement of the working and yield of the claim of Schlein Brothers, Tipton Hill.

This claim has been opened for a number of years; and with a small head of water, varying from 20 to 100 inches, a fall of 70 feet for hydraulicking, a short "string" of small sluices, and common duck-hose, and without the use of quicksilver, it has produced an average of \$6 per day to each man employed. The owners of this claim estimate the length of this drift-channel, to one of the branches of Otter Creek, at 8,000 feet, and its width at 800 to 1,600 feet. There are ample facilities for extensive working; the fall for tailings is good, and a hydraulic pressure of 300 feet can be obtained at little outlay.

The channel from Tipton Hill, intersecting Mount Gregory Ridge near its eastern extremity, must have flowed, if the "ancient-river" theory is correct, from south to north, since at the northern end the rim-rock is perhaps 100 feet lower than at the southern.*

Parallel with Mount Gregory Ridge lies the divide between Otter Creek and Missouri Cañon, occupying an average width of one mile and in length about seven miles, the greater portion of which is covered with auriferous drift. Its main features are similar to those described in the Mount Gregory region, though the bottom stratum of gravel is generally not so thick, while in many places the volcanic mud or "cement" is thicker and harder. The strata above the bottom have been less prospected. The bottom stratum has in the main been exhausted by drifting. It was excessively rich, yielding in many instances from 10 to 50 ounces to the panful. In depth the drift is from 10 to 300 feet, but the small water-supply upon the ridge, the hardness of the stratum next to be attacked if work is continued, and the general decay of the section, have left all the upper layers nearly intact. In some localities some of these are known to contain gold enough to warrant hydraulic working; and the advent of water will lead to the washing away of much of this ground, the facilities for tailings being excellent. Upon this divide are located the diggings of Gopher Hill, Darling's, Harrison, Cement and Bottle Hills, Mount Calvary, and Jones's Hill. Large amounts of gold have been taken from each of these places. An exceedingly favorable place for hydraulic operations is Mount Calvary, where the gravel is less mixed with volcanic *débris* than in the other localities mentioned. The depth of gravel averages 75 feet, and covers an extent of perhaps 200 acres, of which the Mount Gregory Water and Mining Company owns an undivided one-half of 160 and C.

* "Perhaps after all," says Mr. Fairchild, "there may not have existed at a former period any ancient-river system, as some have theorized. To the writer it is quite as evident that some other cause than streams running at right angles with those of the present day, formed the immense banks of drift found along the lower Sierra. Certain it is, that in each hill containing such deposits are found basins deeper than the surrounding rim, with seldom a natural outlet as low by many feet as is the center of the basin. And while the rock of the center shows smoothness from attrition, the surrounding rim is quite the reverse, being rough and jagged." These features suggest to his mind icebergs and glaciers as possible agents. (See a subsequent chapter on this subject.)—R. W. R.

H. Calmes the remainder. From this gravel-bank prospects of 5 cents to the pan are not infrequent. In a few years the gold-product of El Dorado County will be greatly augmented from the divide between Otter and Cañon Creeks. It should be added that there is a small ditch now running water here; its length is about thirteen miles; capacity about 50 inches; owners, Barklage Brothers.

Upon the banks of the Middle Fork, at the base of Mount Gregory Ridge, and 60 to 100 feet above the bed of the stream, are many deep gravel-banks which pay well. That of Thomas McCall is the most noted. Its location is near Gray Eagle Bar; its area about 65 acres, with a depth of about 80 feet. A small hydraulic is operated there in winter, the water for which is obtained from a small, steep ravine coming down from the side of Mount Gregory. In summer, some drifting is done. It will probably average 80 cents per cubic yard, and is a valuable claim.

It is unnecessary to particularize further. This drift-deposit extends almost continuously for a distance of twelve miles east and west, and bears similar general characteristics. Isolated deposits, of a few acres each, occasionally occur farther to the westward, one being located at Centerville, near Pilot Hill, in which are found heavy quartz-boulders, smoothly washed. A number of these have been found containing gold, from one of which, not long since, over \$8,000 was extracted.

Almost the entire remainder of this region not covered by the deep drift is occupied by shallow placers, much worked, but not exhausted. This section embraces the towns of Centerville, Hogg's Diggings, John-town, Kelsey, Spanish Dry Diggings, and many other small hamlets.

Throughout this entire section have been opened, to a limited extent, mines of a character new to the State, although they may not be strictly peculiar to the region. They are the seam-diggings already alluded to in this chapter. For a width of many miles there runs north and south a belt of metamorphic slate, soft and clayey, seamed with countless quartz-veins, varying in width from the thickness of a knife-blade to "bulges" of many feet, many of them being gold-bearing. Atmospheric action and other causes have disintegrated this rock and oxidized the sulphurets of base metals it contained, leaving the royal metal free in its matrix, and as easily brought by the placer-miner upon the surface as once were the river-bars. Some of these seam-diggings have been worked for years; a few of them have been opened to depths varying from 20 to 100 feet, while many have only been located, prospected, and held for the "good time coming" when there will be no lack of water. Several of these mines, where water could be procured for hydraulicking upon a limited plan, have yielded large amounts of gold; and the introduction of a plentiful quantity of water is expected to render this branch of mining exceedingly remunerative. The most noted claims of this character are Whiteside & Co.'s, at Crane's Gulch; Parsons's, at Georgia Slide; Hart & Co.'s, Jones's, Beebe & Co.'s, at Jones's Hill, and Nagler & Co.'s, at Greenwood. I have not been able to learn the product of any of these mines, but the aggregate every season must be large. The shipment of gold from Georgetown, which is the principal commercial town of the eastern extremity of the region spoken of, during the year 1871, (as obtained from Messrs. Sornberger & Lane,) by Wells, Fargo & Co.'s express, aggregated \$155,582. During 1872, the same house shipped an aggregate of \$230,482 gold-dust, as follows: January, \$14,965; February, \$13,895; March, \$19,257; April, \$25,445; May, \$19,400; June, \$10,610; July, \$20,015; August, \$16,450; September, \$29,540; October, \$18,850; November, \$30,805; December, \$11,250.

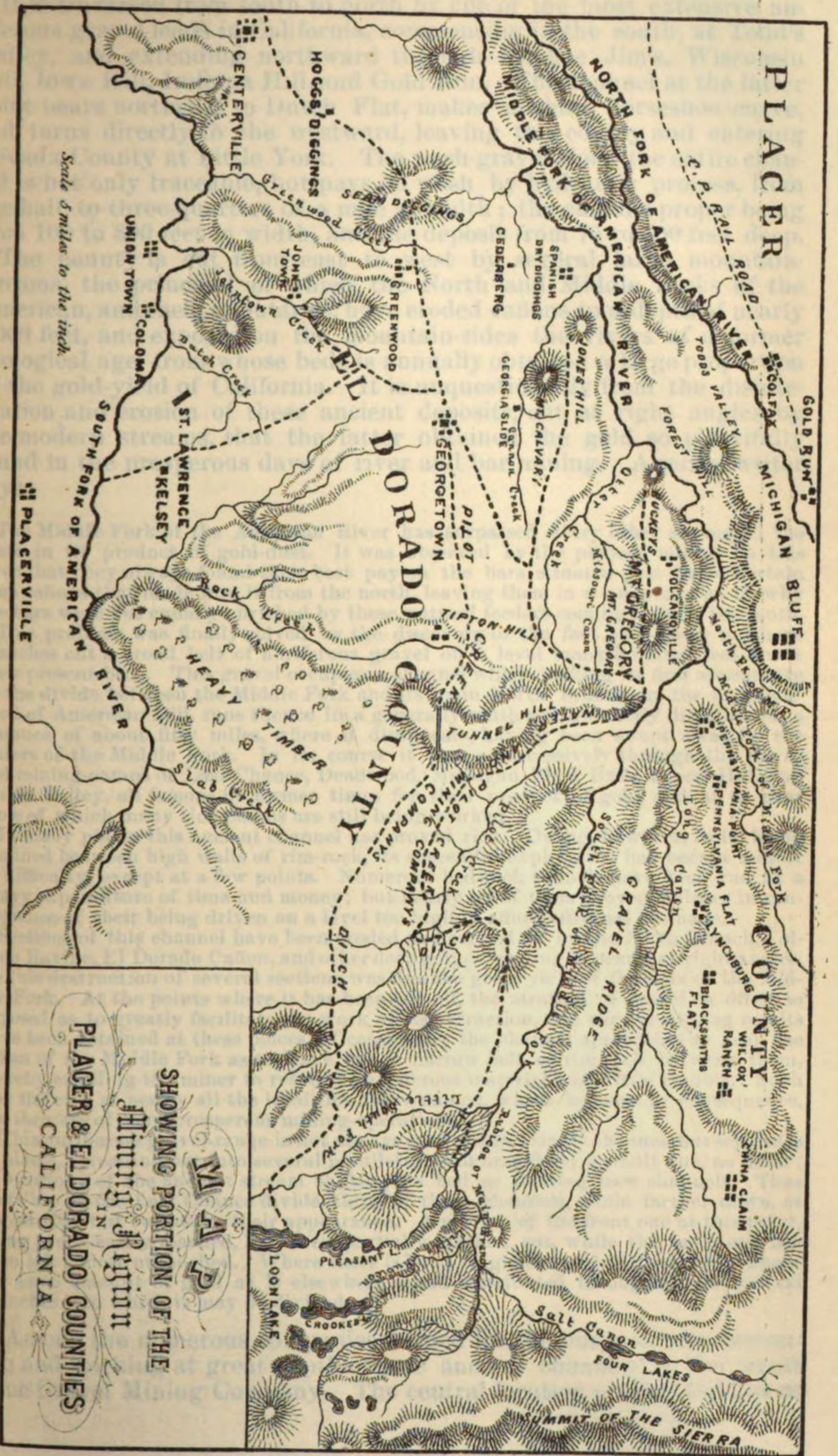
List of quartz-mills in El Dorado County, California. Reported by H. J. McKusick and J. L. Perkins.

Name of mill.	Location.	Owners.	Stamps.	Pans.	Power.	Remarks.
Pacific.....	Placerville.....	Unknown.....	10	....	Steam	Not running; run steadily for several years.
Shepherds'	do	do	10	....	Water	Running part of the time.
Pocahontas	Logtown.....	do	15	....	Steam	Running all the time.
New York and El Dorado.	Loafer's Hollow.....	do	10	....	do	Running most of the time.
Church Union	Aurum City	do	20	....	do	Running part of the time.
Havillah	Nashville	do	40	....	do	Do.
Davidson's.....	Slate Creek	do	20	....	do	Do.
Pyramid	Davy Creek	do	15	....	Water	Not running.
Mount Pleasant.....	Grizzly Flat	do	20	....	Steam	Do.
Eagle	do	do	10	....	Water	Running occasionally.
Swan, McClain & Co.	Brownsville.....	Swan, McClain & Co.	10	....	do	Idle.
Gamble & Richardson.	do	Gamble & Richardson.	5	....	do	Do.
Stillwagon & Norton's.	Near Brownsville.	Unknown.....	5	....	do	Do.
Maurice Dove.....	Volcanoville	Maurice Dove	10	1	Steam	Running occasionally.
Eureka	Georgetown	McClain.....	8	....	do	Idle: rotary battery.
Saint Lawrence.....	Saint Lawrenceburgh.	MacNevin, Buell and Bateman & Co.	20	....	do	Running all of the time.
Brewster	Lyonsdale	Brewster & Co.....	10	....	do	Running occasionally.
Taylor.....	Georgetown township.	W. G. Gibbs & Co.	10	....	do	Idle.
Potter & Hunsucker.	Dutch Creek.....	Potter <i>et al</i>	5	....	do	Running occasionally; custom-mill.
Beattie	Georgia Slide.....	Beattie & Co.....	5	....	Water	Runs on quartz from the seam-claims.
Blue Rock	do	George Ran	10	....	do	Do.
Parsons's	do	Parsons & Co.	10	....	do	Do.
Jones's Hill	Jones's Hill	Jones, Armstrong & Co.	5	....	do	Do.
Cedarberg	Spanish Dry Diggings.	Corporation.....	10	....	Steam	Running steadily.
Sliger.....	do	Hunter, Wade & Co.	5	....	Water	Idle; pending development of mine.
Soup Weed	Soup Weed Cañon.	Unknown.....	10	....	do	Idle.

Note to precede map of El Dorado and Placer Counties.—The boundary-line between these counties, not specially indicated on the following map, commences on the west with the Middle Fork of American River, which it follows eastward along the South Fork of the Middle Fork and the Rubicos or main branch, to the mouth of Salt Cañon, from which point the line continues due east across the summit of the Sierra.

PLACER COUNTY.

This county, adjoining El Dorado on the north, (the Middle Fork and South Fork of Middle Fork of American River being the boundary,) contains an area of about eleven hundred square miles, a large proportion of which is available for gravel and hydraulic mining. There is but one district in which quartz-mining is carried on extensively in the vicinity of Auburn. Outside of this district there is but one quartz-mine of importance, the Rising Sun, near Colfax, which has been continuously worked for several years, with profit to the owners. The lower part of the county is nearly at a level with tide-water, and the upper end is high up among the Sierras, where the snow sometimes lies the year round. This being the case, of course there is a variety of climate, the weather being mild and spring-like in the western part, and in the center, while the eastern sections are buried in snow and swept by furious storms.



M. A. P.
SHOWING PORTION OF THE
MINING REGION
IN
PLACER & EL DORADO COUNTIES
CALIFORNIA

It is traversed from south to north by one of the most extensive auriferous gravel-leads in California, commencing in the south, at Todd's Valley, and extending northward through Yankee Jim's, Wisconsin Hill, Iowa Hill, Indiana Hill, and Gold Run. The channel at the latter point bears northeast to Dutch Flat, makes a short horseshoe curve, and turns directly to the westward, leaving the county and entering Nevada County at Little York. The wash-gravel along the entire channel is not only traceable, but pays to wash by hydraulic process, from one-half to three-quarters of a mile in width; the channel proper being from 100 to 800 feet in width, and the deposit from 75 to 500 feet deep.

The county is cut from east to west by several large mountain-streams, the principal of which, the North and Middle Forks of the American, and their tributaries, have eroded cañons to a depth of nearly 2,000 feet, and exposed on the mountain-sides the rivers of a former geological age, from whose beds is annually obtained a large proportion of the gold-yield of California. It is unquestionably from the disintegration and erosion of these ancient deposits, cut at right angles by the modern streams, that the latter obtained the gold so plentifully found in the prosperous days of river and bar mining. A recent writer says:

The Middle Fork of the American River has surpassed every other stream in the State in its product of gold-dust. It was observed by the pioneer miners on this river that they always found their best pay on the bars situated just below certain deep cañons that made into it from the north, leaving them in a quandary as to why the bars were not equally enriched by these natural feeders coming in from the south.

This problem was finally solved by the discovery of the fact that these northern branches cut a broad belt of auriferous gravel on a level many hundred feet above their present beds. This gravel occupies a channel which, making its first appearance on the divide between the Middle Fork and its main North Branch, in the neighborhood of American Hill, runs thence in a generally south-southwesterly direction for a distance of about fifty miles, where it disappears, having been swept away by the waters of the Middle Fork. In its course it passes successively through the towns and mining-camps of Last Chance, Deadwood, Michigan Bluff, Bath, Forest Hill, and Todd's Valley, all famous in former times for their product of gold, and at or near some of which many rich claims are still being worked.

In many places this ancient channel has proved rich. Owing, however, to its being confined between high walls of rim-rock, its successful exploration has been a matter of difficulty, except at a few points. Numerous bed-rock tunnels have been run at a heavy expenditure of time and money; but nearly all of them proved failures in consequence of their being driven on a level too high to afford effectual drainage.

Sections of this channel have been eroded and carried off by the North Branch, Volcano Ravine, El Dorado Cañon, and other deep gorges, cutting it nearly at right angles. To this destruction of several sections was due the great yield of the bars on the Middle Fork. At the points where it has been cut off, the stratum of gravel is often so exposed as to greatly facilitate the work of its extraction, and very gratifying results have been obtained at these places. Occasionally the channel approaches so near the cañon of the Middle Fork as to leave but a narrow belt of rim-rock between them, thereby enabling the miner to reach the auriferous material with little trouble. Such was the case at nearly all the localities above named, which became, in consequence, the theaters of very prosperous mining-operations.

This auriferous gravel-range is not always confined to a single channel, but separates in places, spreading out into several parallel arms or branches; a result due, no doubt, to overflows of the ancient stream shifting its bed or forming new channels. Thus there are on the Last Chance divide three of these channels, while farther down, at Forest Hill, but two make their appearance. A portion of the front one at this point, being more easily reached, has been partially worked out, while the back one has been left almost untouched. Where there is but a single channel it often carries about the same amount of gold as is elsewhere found distributed throughout the several branches into which it may be divided.

Among the numerous companies formed for the purpose of prospecting and working at great depths these ancient channels is the Great Blue-Gravel Mining Company. The central location of the works is at

Pinkham Hill, some two and a half miles from the ranch of Peyton Powell, on the Forest Hill divide. The company have bonded the gravel-mining claims known as the Rough and Ready claims of Wiley & Co., the Big Channel Company's claims, the Wiley & Seifer claims, and the Spring Garden claims of H. S. Bryan, making from 900 to 1,000 acres, and extending along the gravel-channel of an old, dead river some two miles, which is about 1,500 feet between the rim-rocks, as determined by actual prospecting, for a full mile and a half. Many tunnels have penetrated the channel, and found good, paying gravel, but they were all too high to drain the basin or permit the small companies to fathom the bottom, or determine the depth and value of the deposit to and on the bed-rock. It is the belief of old miners that this channel, as defined by the rim-rock which has been cut and traced for the above distance, is the bed of one of the dead rivers of California. At one point on this ground a shaft has been sunk 160 feet deep, through pay-streaks of gravel, encountering drift-wood that showed plainly that it is the bed of some old river of greater magnitude than any of the living streams in these mountains of to-day. This ground the company proposes to drain by the aid of hoisting-works and pumps, propelled by a powerful engine, or at least to run an incline shaft to the bottom from the end of the tunnel at Pinkham Hill, and determine the depth and character of the deposit down to the bed-rock. The pay-channel, as superficially indicated by limited operations in numerous shafts, slopes, &c., has a width of 1,600 feet or more. Owing to its depth and position, power and perfect machinery are required to keep it free from water and prospect to the bottom and probably richest deposits.

Another similar but less extensive enterprise is being prosecuted a few miles farther up the same ridge. A San Francisco company is engaged in sinking a shaft at Baker's Ranch crossing of Volcano Cañon, for which purpose heavy machinery has recently been transported to the ground. This enterprise, if the company can overcome the water-difficulty and reach the bottom, will, for the first time, test the main ridge back of the claims at Bath, Michigan Bluff.

Nearly the whole area of the country between the North and Middle Forks of the American is auriferous, but its development has been retarded by the difficulty of bringing sufficient water on the ground to work it in accordance with the requirements of modern hydraulic mining, as practiced in more favored localities. The magnificent enterprise of Colonel Von Schmidt and his associates has, for some reason, been abandoned, temporarily at least, and no other project now in contemplation will have more than a local effect on the development of the resources of this divide. As a general rule, the method of drifting and crushing by mills, formerly so extensively carried on near Forest Hill and vicinity, has been abandoned with a view to working out the ground by hydraulic process, when the supply of water will permit; and, until then, the great resources of this part of Placer County will remain undeveloped.

Mr. G. W. Reamer, of Auburn, sends the following communication relative to a portion of this country:

There is in operation one 10-stamp quartz-mill (water-power) on the divide between the North and Middle Forks of American River, at the Powell and Lee mine. Results from crushing very good.

Todd's Valley district mines are mostly owned by Pond & Co. They have a ditch of twenty miles in length, running 1,200 inches of water. These mines pay very well. Forest Hill district has yielded since its discovery about \$16,000,000 of gold-dust. At this time there is but little doing, on account of scarcity of water. None of these mines have been worked farther than a distance of 1,600 feet from the front. They have

yielded as well, for the amount of work done, as any other gravel-mine in the State. The claims are from 4,000 to 5,000 feet from front to rear. They front on the Middle Fork of the American River. There is but one ditch in the district, the Miners' Ditch, carrying 1,800 inches of water.

The district contains 1,200 acres of mining-ground, not more than one-seventh of which has been worked. Most of the mining done here has been tunneling. At present there are but three or four claims working, as the 1,800 inches furnished by the ditch are not more than enough to make about three hydraulic sluice-heads. As much as 1,000 inches are used in a single head, when it can be had. If a large canal could be brought here this would be one of the best districts in the State. This gravel-deposit is from two to seven miles wide and thirty-five miles in length, and probably 400 feet in depth. Where it cannot be sluiced it can often be tunneled with profit.

North and east of the North Fork of the American are situated the active and prosperous districts of Gold Run, Dutch Flat, and vicinity, frequently described in former reports. The following description is condensed from the reports of Mr. L. P. McCarty, published in the Mining and Scientific Press of San Francisco:

The Dutch Flat Water Company is among the most important of its kind in the State. The company's ditches consist of the Placer County Canal, thirty miles long, and Cañon Creek and Little Bear River Ditches, about thirty miles more, including other ditches leading to reservoirs, all of which center at Dutch Flat and Gold Run, and have a capacity of furnishing daily 5,500 inches for twenty-four hours' run. This company owns twelve reservoirs, the largest of which will furnish the above-mentioned amount of water for one week, and all combined will furnish thirty days' water without a drop running into them. The farthest point in an air-line to where the water is taken up for these ditches is twenty-five miles easterly.

The water generally lasts from the middle of December to the middle of August, or from six to eight months. It is reduced at the latter end of the season, from August to December, to about 100 inches. The company is at present disposing of from 3,500 inches of water per day up to their full capacity. Prices received for the same are nine cents per inch for 12-hour water, or fifteen cents for 24-hour water. The measure is counted from the center of the issue with 7-inch pressure.

Leaving Little York and going eastward, the first claim is that of the Summit Mining Company, situated one and a half miles west by south from Dutch Flat. This company's possessions cover an area of 50 acres of mining-ground, and 190 more of timber-land, all of which is covered by United States patent. The improvements consist of one and a half miles of 14-inch pipe and 600 feet of 4-foot flume, 2 feet deep, with five under-currents; the claim is better located for using the latter than any other on the flat; working two of Hoskin's Little Giant monitors, with $3\frac{1}{2}$ and 4 inch nozzles, running 350 inches of water under 175 feet pressure; 125 feet more pressure will be added to this after the first of next month. Four hundred feet fall is had from their flume to the lowest under-current, and 200 feet more of dump is obtained from there to Bear River, where the tailings fall. This claim is one of the few that is being cleaned to the bed-rock.

The Dutch Flat Blue-Gravel Company, a San Francisco incorporation, acquired by purchase, during the year 1871, the ground formerly owned by James Taeff, consisting of about 30 acres, and during the present year proceeded to open it on a scale unparalleled in the annals of hydraulic mining. Six-inch and eight-inch Little Giant monitors of the Hoskin's patent were used, running through the pipes from 1,000 to 1,200 inches of water, under a head of 400 feet; but as the ground was opened near the surface, where smaller streams would have been quite as effective, the yield was not commensurate with the expense, and operations were

suspended. When again opened it will probably be by a bed-rock tunnel, run from Bear River, which will "bottom" the claim. The bed-rock under the principal portion of the channel in this claim has never been reached, but the known depth of gravel is 150 feet, and the top gravel is 2,000 feet wide.

Gold Run, four miles nearly west of Dutch Flat, on the line of the Central Pacific Railroad, contains about eight hundred inhabitants, and is one of the busy mining-towns of this county. Surrounding the town are a larger number of paying claims now working than at any other camp in the county. Beginning at the most southerly of these claims, distant one and a half miles southeast of the village, is the Cement Mill Company. The company's possessions consist of a bed of hard cement 1,600 by 400 feet, and 9 feet thick. In their improvements is comprised an 8-stamp mill, run by water-power, which can crush about 40 tons per day, and which is running to its full capacity. The average pay is about \$4 per ton. They are at present engaged in drifting in a breast 100 feet wide, and are in 400 feet. Benches are left to support the mass above, and but very little timbering is done.

The Indiana Hill claim, of Judd, Brown & Miner, is a very extensive claim of about 40 acres, situated on the channel. It is being vigorously worked, using two monitors, running 500 inches of water.

The property owned by the Gold Run Hydraulic Mining Company, limited, was formerly known as the "Cedar claim," and consists of about 37 acres in the heart of this mining-section, the channel running the entire length of it. A deeper deposit of blue gravel is found here, probably, than at any other point on this celebrated channel. This property has recently been purchased by an English company for the sum of \$60,000. The principal office is in London. This company owns no ditches, but purchases water. The improvements consist of about 1,400 feet of flume, 4 feet wide by 2 feet deep, blocked the entire length. The flume has a grade of 8 inches to 12 feet. They also have 1,500 feet of 16-inch pipe and the same amount of 11-inch pipe, and work two Little Giant monitors with 4 and 5 inch nozzles, using 500 inches of water under a pressure of 240 feet. The present working is at least 125 feet above bed-rock, with a bank of gravel above and facing them, 215 feet high. The average yield for thirty days' run has been from \$6,000 to \$8,000.

The Gold Run mining-claim, about one mile east of Gold Run station, and adjoining the above on the northeast, consists of 40 acres of mining-ground on the main channel, and the improvements are 650 feet of bed-rock tunnel, that cost \$30 per foot to construct; also 1,300 feet of bed-rock flume, (doubled through the tunnel,) 4 feet wide by 2 feet deep. They have 1,600 feet of 30-inch and 900 feet of 16-inch pipe, and work two of Hoskin's Little Giant monitors of 3½ and 4 inch nozzles, lead pipes 11 inches in diameter, carrying 640 inches of water under 325 feet pressure. The bank of pay-gravel at present facing them is 130 feet high and fully 150 feet above bed-rock. Average receipts \$6,000 per month.

The explorations of the Indiana Hill Cement Company, before alluded to, have demonstrated the richness of the lower or bed-rock strata of this channel. A tunnel has been projected and surveyed, from a point on Cañon Creek, and operations commenced with a view to the opening of the claims of this district. The deep cañon of the North Fork of the American, nearly 2,000 feet lower than the bed-rock of the ancient river, affords an opportunity, rarely found in the gold-region, of working out the entire gold bearing strata of the ancient channel, the North Fork forming a receptacle for the tailings from above.

The quartz-interest of this county, after a long period of inactivity, is once more assuming some prominence, and since early days has never looked so promising as now. Abandoned mines are being re-opened, and in many instances successfully worked; and new discoveries are made, particularly in the vicinity of Auburn.

The Solsic mine, recently discovered, has a shaft down 150 feet, showing a vein of from 1 to 2 feet. About 300 tons of ore have been extracted, which has yielded an average of \$30 per ton. The country is metamorphic slate, and the lode is well defined in its encasing walls.

The Auburn mine, a strong vein in the same formation, has, at a depth of 175 feet, a fine body of very rich ore. The lode has 30 inches average thickness. The general appearance of the vein, its character and surroundings, are sufficient to warrant the company in erecting a 10-stamp water-mill on the premises, which is now under contract.

For the foregoing information relative to quartz-mining in Auburn and Ophir districts I am indebted to Mr. C. H. Crossman.

The Greene mine, two and a half miles east of Auburn, has acquired notoriety from its persistent yield of high-grade rock. This mine has a length of 1,132 feet, the ledge running east and west and dipping south. The improvements consist of fine hoisting-works run by a 30-horse power engine; the pumps (Cornish) are run by a 40-horse power engine. The company also owns a mill, run by water-power, and used principally for reducing specimen rock. It contains four stamps and two Hepburn pans. The ledge is a little over 2 feet thick, and the rock from the 240-foot level will, it is thought, yield over \$100 per ton. There have been, in all, more than 500 tons of rock crushed from this mine, the average yield of which has been about \$100 per ton. Most of it was taken from and above the 125-foot level. In sinking the shaft from that level to its present depth, the rock has maintained its almost unsurpassed richness. This mine has never levied an assessment, having paid its way from the croppings down.

The mill and mine of the Saint Patrick Mining and Milling Company are three miles west of Auburn, and two and a half north of Newcastle. This company own fourteen ledges, varying in length from 1,200 to 2,000 feet each, working only four of them. The main shaft on one of these is down 300 feet, and has hoisting-works run by an 8-horse donkey-engine. The others are worked by windlass. The 15-stamp mill is run by a 40-horse engine, and will crush 24 tons per twenty-four hours. The company is also running on one of the ledges a tunnel 300 feet long, nearly completed, 5½ feet high and 4 feet wide. The formation is granite and metamorphic slate; the width of veins 2 to 10 feet.

The Saint Lawrence mine is one-quarter of a mile south of the Saint Patrick, and near Ophir. The claim is 1,200 feet in length. The 6-stamp mill, run by free water, can crush 12 tons per twenty-four hours. The two inclines, at an angle of 30°, show the ledge, at 50 feet depth, to be about 2 feet wide.

The Bellevue consists of a series of parallel veins in slate, small but well defined, coursing east and west, dipping south, and systematically worked by shafts and adits to the depth of 150 feet, for a distance of 1,000 feet on the main vein, with a view of cross-cutting and working the several veins from one line of permanent works. No ore is now extracted but such as is taken from the works of development. It has paid \$30 per ton, for about 600 tons in all. There are good hoisting-works, run by water-power derived from the Bear River Ditch. The number of men engaged in all departments is about 20, taking out, on an average, about 40 tons of rock per week, which they crush at the Saint

Patrick Company's 15-stamp mill, located within half a mile of this mine. The rock costs 75 cents per ton for hauling, and \$5 per ton to crush. The specimen ore for which this mine is noted runs very high. The company is running a tunnel on one of the ledges, parallel to the one on which the hoisting-works are situated, from Doty's Ravine on the west end, following the ledge right in.

The Peter Walter Mining Company is located about three miles west of Auburn. This company claim a ledge of 900 feet in length, which runs east and west and dips to the south. Their improvements consist of steam hoisting-works, which are run by an engine of 25 horse-power.

The Julian gold-mine is located near Newcastle. The claim is 2,500 feet. The ledge runs north and south, dips east, and is 3 to 8 feet thick. It is one of the largest ledges in this section, and the mine is one of the best developed in the country, showing a large amount of ore. There are four shafts, 800 feet apart, reaching a depth of 230 feet. At the 150-foot level connections are made giving a body of solid ore 100 feet in height, the vein being about 20 inches thick, and valued at \$15 per ton. A first class 20-stamp mill has been erected, with hoisting and pumping works adequate to sink 500 feet and lift both water and ore.

At the Golden Eagle mine a new shaft is sinking. From and above the 80-foot level 150 tons of ore yielded over \$20 per ton. At the present depth the ledge is wider and prospects richer. It is the calculation of this company to sink 100 feet lower, at which depth they anticipate, from present indications, a ledge that will pay them handsomely for their pains and labor. They have a 10 horse-power engine for hoisting. A full force of men is employed day and night.

Crater Hill contains a net-work of veins intersecting nearly at right angles, (east by west and north by south,) and has been noted for its richness. Work is regularly prosecuted on but one of them at present, the Crater vein. Shaft, 130 feet deep; level at this depth, 120 feet long; vein averages 12 inches; ore paying about \$50 per ton; formation granitic.

The Shipley mine, west of the foregoing, has a shaft 150 feet deep. Levels are driving regularly. The ore is valued at \$20 to \$25 per ton. Vein 3 feet, encased in slate. Steam hoisting-works and 10-stamp mill, (water-power.)

The Mina Rica, west of the Greene mine, and supposed to be on the same ledge, is developed energetically, with fair prospects of reaching a pay-shoot.

North of the South Fork of the Middle Fork, and between that stream and the middle branch of the Middle Fork, is the interesting region known as Long Cañon Divide, extending about twenty five miles from east to west, with an average width of at least four miles—a deep, continuous deposit of gold-bearing gravel. Like the region south of it in El Dorado County it is covered with volcanic *débris*, but unlike that it is, on the higher eminences, overlaid with a lava-formation, which in some places is harder than the bed-rock beneath. Upon all the points, however, which on each side of the ridge shoot out on the occurrence of lateral cañons, the gravel has been denuded of all volcanic *débris*, and banks of beautiful quartz-gravel are alone to be seen. The depth of this vast deposit varies from 10 to 300 feet, and it is not infrequent to find a stratum of gravel 30 feet thick, which will pay 60 to 80 cents per cubic yard, while the other strata of gravel, which alternate with sand and volcanic ashes and lava, almost invariably show the "color" to each pan of dirt. In this locality but little mining has been done, so little as to amount only to prospecting. No ditches, other than two or three with a

capacity of from 25 to 100 inches, have ever been constructed. The most extensive working has been done by a company of Chinese, who purchased a claim here some years ago for the sum of \$5,500. They procure water from a small cañon called Chipmunk Ravine, and are only enabled to work during a portion of the winter and spring months. About an acre of ground has been washed off, to the greatest depth of perhaps 30 feet, with small sluices tailing into Long Cañon, and from which they are compelled to fork out the coarser stones, because of lack of fall to carry them away; and with two derricks to hoist out and pile up the large boulders, the progress made is necessarily slow. And yet it is said by those who best ought to be informed that this company produces annually about \$15,000 in gold-dust. Upon the north side of the ridge the mine spoken of could be opened with a fall sufficiently great to send off everything below, provided there were a sufficient amount of water. A ditch, which is only seven miles long, above this claim, has been commenced by John Wilcox. If completed it will afford a fair supply for the whole divide, coming, as it does, from the Middle Fork of the American River. There is also a small ditch, owned by Richards Brothers, capable of supplying 1,000 inches if improved. It is taken from Long Cañon, several miles below the Chinese claim, and cannot be made available for hydraulics until it reaches the vicinity of a place known as Blacksmith Flat, seven or eight miles down the divide. It has at command a large area of rich auriferous country below. The extreme point of this divide, called Pennsylvania, embraces many acres of excellent gravel-banks showing gold. A mile or two from it is Pennsylvania Flat, where a small opening has been made, with water from a little cañon hard by. Last spring three men washed there with a small amount of water for a period of twenty-eight days, cutting down the bank to a depth of 20 feet, and cleaned up, as the result of their labor, \$1,800 in gold-dust. Apparently there are thousands of acres of similar ground before them. It cannot be long before this section will receive the attention it deserves.

NEVADA COUNTY.

This county embraces undoubtedly one of the richest mining-regions in the world, and the district of Grass Valley, especially, stands first in rank among gold-producing localities. Mr. A. Delano, a banker of Grass Valley, who has resided and done business in that locality over twenty years, recently estimated in a lecture that the district of Grass Valley alone had produced, since 1849, over forty millions of gold, and that from 1852 to 1860 something like \$300,000 per month had been taken out, nearly all of which came from placer mines. The few quartz-mills then in operation had very imperfect machinery, and their gold-saving apparatus was very defective.

At the present time Grass Valley is essentially a quartz-mining town, many of the placers having been reworked twice or three times, and being therefore practically worked out. There are entered on the records of the district 1,100 distinct quartz-ledges, at least 500 of which, Mr. Delano estimates, might be profitably worked, if the capital to do so was forthcoming. Instead of that there are now only ten or twelve actively worked, and instead of 25,000 miners, who might be employed in the district, there are only a little over 1,000 at work. These few produce, nevertheless, enough to cause monthly shipments of from \$200,000 to \$250,000 in gold. In the same lecture Mr. Delano

estimates that the whole county of Nevada has produced, since mining-operations were begun, \$105,000,000 in gold, which he divides as follows :

Grass Valley	\$40, 000, 000
Nevada City.....	40, 000, 000
San Juan.....	10, 000, 000
Columbia Hill, North Bloomfield, Washington, Omega, Cherokee, and Woolsey's Flat	10, 000, 000
Other localities	5, 000, 000
	105, 000, 000

The Grass Valley Union gives the following list of quartz-mines which have been actually worked during the year in the district, though not all of these have been worked continually : Idaho, Coe, Eureka, Howard Hill, Empire, Greenhorn, Daisy Hill, Green Mountain, Jones, Slate Ledge, (Perrin's,) North Star, Independence Tunnel, Hunt & Talbot, Never Sweat, Knight of Malta, Sappho, Grass Valley Mining Company, Gashwiler, Reese, Schuylkill, Cedar, and others. Of gravel-mines, the Town Talk, Independent, Enterprise, Phil. Roberts & Co., Hope, Reuben Thomas, Dartmouth, Picayune, and others have been worked.

The Eureka Company, whose sudden misfortune in meeting very low-grade ores in the lower levels I stated in my last report, has done much better during the year than was expected, though it is far from being in the highly prosperous condition of former years.

From the superintendent's report I condense the following summary :

Report of the Eureka Company for the year ending September 30, 1872.

The company has driven 881 feet of drifts, 644 feet of cross-cuts, sunk 223 feet of main shaft, and also sunk 105 feet of winze, and run 363 feet of tunnel. The vertical depth of the main shaft is 961½ feet, or 1,072 feet on the incline. There have been hoisted 9,925 tons of quartz, and crushed 9,730 tons in 293 running-days, averaging 2.079 tons per day to each stamp. Of sulphurets 103 tons have been concentrated, 77 tons worked, and 30 tons remained on hand, worth about \$3,900. During the year 9,925 tons of quartz were extracted from the various levels of the mine. There were upward of 4,000 tons of good pay-ore in sight, that the superintendent calculates will pay all ordinary expenses for the further development of the mine for the next six months at least.

The expense of mining has been higher than usual, owing to quartz from the intermediate level, 2,839 tons, having to be handled twice, and also the stringers taken out on tribute. The milling has also been higher owing to the company not being able to keep more than 15 stamps running, requiring the same number of amalgamators and engineers as 30 stamps do. The superintendent gives no decided opinion as to the future prospects of the mine.

The secretary's report shows the following items :

RECEIPTS.

Cash, October 1, 1871	\$25, 867 90
Bullion	220, 010 31
Construction	50 00
Sulphuret-reduction works.....	4, 872 24
Milling	150 00
Wood-ranch	1, 068 00
Wood-account.....	6, 072 13
Premium and discounts	415 75
McDougal works	771 13
Total	259, 277 46

DISBURSEMENTS.

Dividends	\$20,000 00
Mining	101,864 91
Mining-account, (prospecting)	18,301 50
Milling	22,956 32
Sulphuret-reduction works	4,663 24
Roannaise mine	6,617 50
Mobile mine	3,272 16
Construction	8,885 00
Mine-purchase	6,008 50
Sulphuret-concentration	1,821 25
McDougal works	612 00
Wood-ranch	1,018 25
General expenses	5,705 69
Bullion-expenses	843 44
Discount	53 16
Cash, September 30, 1872	56,654 54
Total	259,277 46

The assets are estimated at \$150,599.31, of which the mill is calculated at \$40,000, and the building and improvements at the mine, \$30,000. There are no liabilities. The average value of the ore worked was \$22.95 per ton, and the average yield of the sulphurets \$127.22 per ton. Bullion from the mill was worth \$17.56 per ounce, and that from the chlorination-works \$19.74 per ounce. The cost of mining 9,175 tons was \$101,184.07, or an average of \$11.03 per ton. The cost of milling 9,730 tons was \$22,856.32, or an average of \$2.35 per ton. The cost of concentrating sulphurets was \$17.68 per ton, and of reducing them \$28.06 per ton. The net profits were \$61,799.86, of which \$20,000 was paid as dividends to stockholders, \$8,885 for construction, and \$6,008.50 for the Mobile mine.

From the formation of the company, October 1, 1865, to September 30, 1872, the receipts were \$3,606,265.91, of which \$3,585,543.85 were from bullion taken out. Of the disbursements, \$1,714,000 was paid out as dividends; \$1,381,614.79 for mining and milling expenses; \$301,906.50 for titles to property, &c., and \$141,939.71 for construction. The net profits from October 1, 1865, to September 30, 1872, were \$2,224,651.12.

Report of the North Star Mining Company for the year ending September 5, 1872.

From the report of this company I extract the following important items:

The company has worked 6,601 tons of ore, yielding 8,735 assay ounces gold, valued at \$153,349, or \$17.55 per ounce; net value of sulphurets worked, \$8,324; from tributors, \$2,945; from ore-crushing, \$2,495; from premium on bars, \$296; from miscellaneous sources, \$9,898, making total receipts of \$177,307. Adding \$1,243 for value of supplies on hand at commencement of year, gives a grand total of \$178,550. The total disbursements for the year aggregate \$182,687, or \$4,137 in excess of the receipts, which is the amount of the present liabilities. At the commencement of the last fiscal year the company owed \$13,872. This indebtedness has not only been wiped out, but the sum of \$18,644 has been expended in permanent improvements at the mine and mill, while dividends of \$27,000 have been paid to stockholders. The other disbursements for mine and mill supplies, labor, taxes, insurance, &c., show an aggregate of \$123,164. As there are 3,000 shares in the mine, of the par value of \$100 each, stockholders have reaped 9 per cent. interest for the year on their investment. During the previous year stockholders received \$76,500 in dividends, against \$6,000 in 1869-'70, and \$45,000 in 1868-'69. The mine paid its first dividend, after incorporation, in June, 1868. Thus in four years it has paid \$154,500, but in the mean time it has collected \$60,000 from stockholders, leaving a net profit of \$94,500, or \$31.50 per share. This is less than 8 per cent. interest per annum on the capital stock.

The Idaho Company has remodeled its works during the year, and has now a splendid establishment. This company stands at present first among the gold-mining companies of California.

Report of the Idaho Company for the year ending December, 1872.

The superintendent, Mr. Edward Coleman, says:

We now have a 35-stamp mill and two rock-breakers, with all the modern appliances for saving gold and sulphurets. These are driven by a 20-inch engine, 44 inches stroke,

and it is believed that with the usual repairs incident to running a quartz-mill, but little expense will be incurred, in running the mill, for years to come. The hoisting-works are all complete and in good running order. There are two engines, 14 inches in diameter of cylinder, and 5 feet of stroke, for hoisting the cages. There are two 10-inch-cylinder engines, of 16-inch stroke, for hoisting tubs and for use in sinking the shaft. They are all set on solid foundations of masonry, as is also the mill-engine. The underground work connected with the new shaft has been pushed on continually during the past year. The timbers used in keeping the shaft open are as follows: 14 inches square from the 400-foot level to the 200-foot level; 12 inches square from the 200-foot level to about 80 feet from the surface, and thence to the surface timbers of 15 inches square are used. We have now on hand nearly all the timbers required to complete the shaft to the 600 level. These are 15 inches square. I again take pleasure in reporting the condition of the mine as encouraging, and with the increased facilities of working, it may reasonably be expected that the profits for the coming year will largely exceed the profits of any preceding year. I have also to report that all the business and the affairs whatsoever connected with the mine are in a satisfactory condition. I would also call your attention to the apparent increase in the working expenses of the milling and mining of the ore. This was caused, necessarily, by preparations for working the mine on a larger scale, and of which the future will get the benefit. During the past year we have run 590 feet of "drifts," made 189 feet of "raise," and completed 389 feet of new shaft. The shaft is now completed to the 400 level. We have, also, raised a small working shaft from the 500 level to the 400 level, and we are now opening out for the timber at the 500 level. During the year we have crushed 11,410 tons of ore. Of this 950½ tons came from the 400 level, 7,805½ tons from the 600 level, and 2,654½ tons from the 700 level. The 400-foot level is in to 286 feet from the new shaft; the 600 east level is in 584 feet from the line of the old shaft, or 414 feet from the new shaft, and the 600 west level is in to the line of the Eureka mine. The 700 west drift is in 74 feet from the old shaft, and the 700 east drift is in 192 feet from the old shaft, or 9 feet from the run of the new shaft. The yield of the mine has been—

Bullion, 22,331 ⁴⁶ / ₁₀₀ ounces, valued at.....	\$390,830 50
Sulphurets 81½ tons	8,872 10
Specimens and tailings.....	762 73

Total.....	400,465 42
or an average of \$35.09 per ton.	

COST OF MINING AND MILLING.

Surface labor.....	\$21,482 75
Underground	80,323 49
Wood and poles.....	12,244 94
Candles and oil	3,477 13
Hardware and steel.....	4,328 02
Lumber and coal.....	2,310 08
Powder and fuse.....	1,071 56
Foundry.....	2,306 69
New ropes, and sundries.....	1,659 09
Superintendent's salary.....	3,000 00
Total.....	133,203 75

SULPHURETS.

Labor in saving 81½ tons.....	\$1,340 00
Reducing 78 tons.....	2,084 15
Grinding sand from creek.....	270 10
Total.....	3,694 25

CONSTRUCTION-ACCOUNT.—MILL.

Labor	\$6,745 75
Lumber	3,706 42
Foundry	23,340 97
Hardware.....	2,099 46
Sundries.....	2,796 82
Total.....	38,689 42
Additional quicksilver	\$690 00
Copper plates and hose.....	1,172 56
Total.....	1,862 56

DITCH AND RESERVOIR.

Labor, &c	\$1,375 23
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NEW SHAFT.

Labor, surface	\$3,577 50
Labor, underground	16,954 75
Lumber and materials	9,264 89

Total	29,797 14
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Ropes, cages, and cars for new shaft	\$4,067 75
Retimbering old shafts and drifts	2,794 00

Total	6,861 75
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HOISTING-WORKS.

Foundry	\$12,561 15
Materials, &c	13,869 27

Total	26,430 42
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GENERAL EXPENSE.

Insurance	\$1,730 00
Law expense	450 00
Pump for old shaft	352 50
Estate of J. S. Henning	5,000 00
Expense on bullion	1,997 20
Prospecting east end of claim	144 00

Total	9,673 70.
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RECAPITULATION.

Mill and mining	\$133,203 75.
Sulphurets	3,694 25
Retimbering	2,794 00.
General expense	9,673 70.

Total	149,365 70.
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CONSTRUCTION-ACCOUNT.—AGGREGATE.

Construction—mill	\$38,689 42.
Hoisting-works	26,430 42.
New shaft	29,797 14
Ditch and reservoir	1,375 23
Quicksilver, &c	1,862 56
Ropes, cages, and cars	4,067 75

Total cost of construction	102,222 52
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RECEIPTS.

Cash on hand from last settlement	\$16,972 40
Bullion, 22,331 $\frac{46}{100}$ ounces	390,830 59
Sulphurets, 81 $\frac{1}{2}$ tons	8,872 10
Specimens and tailings	762 73
Chinese lease	100 00
Water-rent	700 00
Pan-rent	270 00
Extraordinary	2,500 00

Total receipts	421,007 92
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Total expenditures, including dividends	414,338 22
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Balance on hand	6,669 70
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The secretary, M. P. O'Connor, made a report which necessarily contains much that is not in the superintendent's report. I collate from the secretary's report the following:

Number of shares of stock 3,100, or one foot to the share. Of these 2,880 shares are owned in Grass Valley, and 220 owned by non-residents of this place. The par value of a share is \$100.

The total receipts from all sources for the year 1872, to December 16,	
amount to	\$404,035 52
Balance in treasury at commencement of the year	16,972 40
Total for the year	421,007 92

Expenditures for the year are as follows:

Dividends	\$162,750 00
Other disbursements	251,588 22
Total	414,338 22

For the last four years the total earnings of the Idaho mine have been as follows:

1869, ending in December	\$306,038 75
1870, ending in December	183,450 23
1871, ending in December	407,301 16
1872, ending in December	404,035 52
Total for four years	1,300,822 66

Dividends for the same years have been paid as follows:

1869, eleven dividends	\$170,500 00
1870, eight dividends	37,200 00

The placer-mining interest of the county was extensively treated in my last report; I insert, however, the following descriptions of the most important works of that kind.

Dr. Henry DeGroot, of San Francisco, furnishes the following description of one of the most extensive hydraulic operations of Nevada County, that of the Little York Hydraulic Mining Company:

The property, which, considered as a whole, constitutes one of the most valuable mining-estates in California, is situated in Little York township, Nevada County, and but one mile from the Central Pacific Railroad. Besides a tract of 240 acres secured by United States patent, this company own a considerable extent of mineral-ground adjoining at different points, held under the local mining-laws, also nearly 2,000 acres of fine timber-land, with saw-mill, &c., contiguous, on the east. They have three ditches, aggregate length forty-five miles, and capable of carrying 3,000 inches of water, the sources of supply being Steep Hollow and Bear River, lying between the deep cañons cut by these two streams; they have an outlet with a fall of over 600 feet on each, giving superior facilities for washing-purposes. Three sets of hydraulic apparatus, very powerful and perfect, have been fitted up for washing here. Two of these are on the subdivision of the tract known as the Little York, and the other on the Liberty Hill claim, a third subdivision, called Christmas Hill, lying between them. The latter, though opened and ready for the reception of the gearing for washing, has not yet been furnished with any. From each of the three points fitted up for work a ravine extends to the deep cañon on either side, two of these opening on Bear River and one on Steep Hollow. Along these ravines nearly two miles of flume have been laid down, the whole fitted up with dumps, undercurrents, &c., the fall being such as to admit of some of the latter being over 30 feet high. At the head of each of these ravines a long tunnel, flumed throughout, has been cut through the bed-rock, furnishing a passage for the water and gravel, the old-river channel here lying in a basin with high river-rock on either side.

What is known as the "blue lead" runs through the whole extent of the company's ground, being here from 250 to 600 feet in width. While this, wherever worked, has been found extremely rich, the entire body of gravel, for the breadth of a mile or more, contains enough gold to pay for washing by hydraulics. The bank varies in depth from a few feet, where the bed-rock approaches the surface, to 200 feet in the deepest part of the channel. As usual the upper portions of the gravel are poorer and the gold finer, the latter gradually becoming coarser and more abundant toward the bottom, a very

rich layer of gravel always being found on the bed-rock, especially in and on the sides of the main channel. Lying near the bed-rock is a stratum of hard cement from 10 to 40 feet thick. Formerly this was crushed with stamps and the gold saved by amalgamation in the batteries, but with the powerful nozzles and head of water now in use, from 200 to 300 feet, this cement can be sufficiently broken up to send it through the sluices, where it meets with final disintegration in its passage over the numerous dumps encountered on its way. The cement-mills of the company are therefore no longer in use, nor is it necessary to employ powder for breaking up the ground and preparing it for washing. Of this company it may be said that while they have as valuable a tract of mining-ground, perhaps, as any other in the State, their outfit and the general administration of their property are equal to any found elsewhere. Their extensive flumes and undercurrents, from 4 to 6 feet wide, are built of the most durable material and set with great care. Over four miles of heavy iron pipe, from 12 to 30 inches in diameter, (much of it lately substituted for wooden flumes,) has been laid down. Monitor nozzles, all of the largest size and latest plan, are in use in each of the mining-pits. Powerful derricks, operated by hurdy-gurdy wheels, have been provided, whereby immense boulders can be expeditiously handled with small expenditure of manual labor. In short, all the most approved methods and machinery as well as labor-saving appliances extant have here been introduced; what were very acceptable styles of apparatus but a short time before having sometimes been laid aside, after short use, upon something more economical or efficient presenting itself, this company having been liberal patrons of inventors in this department of mechanism and discovery.

The ground of the Little York Company is not only extensive, but much of it is known to be extremely rich, the old "blue lead" having paid here enormously in the early day. Immense quantities of gold were taken out at points where the rim-rock had been broken away, and in cases where incline shafts were sunk on its inner side as far down as the water would admit. Large sums were extracted at these spots within the present limits of their claim, without the richest portions of the channel ever having been reached. As washing has progressed towards its center, at the few points where work has been carried on, the product of gold has been liberal and often very large.

The company only using a portion of its water, the balance being sold, and running but two of the hydraulics fitted up, washed out at the rate of \$15,000 per month during the year 1872. The property having now passed into the hands of a London company, the new owners will not only make use of all the water their ditches afford, but increase the quantity, which can be easily done, and also start up the other hydraulic, and perhaps rig a fourth on the Christmas Hill ground. With these additional facilities for production the yield of these mines might be nearly doubled. The outlay required for so increasing the capacity of the works would not be large, nor would current expenses be materially augmented thereafter. In operating this class of mines the great item of expense is water, labor being only secondary, as but a small force of hands is required. To a company having their own water the profits resulting from the working of a property like this should be large—at least 75 per cent. of the gross earnings.

As to the time likely to be required for working out a body of gravel like this, it is useless to indulge in speculations, inasmuch as it must necessarily be so long as to deprive the question of all practical significance.

The Union gravel-mine is located at Relief Hill, three miles east of North Bloomfield and about nine miles north of Nevada City. The company own one and a quarter miles in length on the channel of the lead, which at this point is about one-half mile wide. There is no probability that the next generation will see it worked out. This claim has been worked for three years past, but hydraulic washing has been done but about six months of that time. The company's improvements consist in part of 2,000 feet of flume, 40 inches wide by 20 inches deep, with 10 inches grade to every 14 feet, all blocked with 20-inch square blocks, 6 inches thick; 2,175 feet of 15-inch pipe, and 800 feet of 18-inch pipe; also a reservoir built last year at a cost of \$5,200, situated one mile from the present workings. This reservoir has a capacity of supplying 500 inches of water for forty-eight hours, when full, without receiving a drop. To get a lower grade of 152 feet below the present working, the company are engaged in running a large tunnel, which, when completed, will be 1,500 feet in length, 6 feet 4 inches high, by 6 feet wide, with a grade of 6 inches to every 12 feet. This tunnel was commenced August

18, 1870, and has been worked with from two to three shifts per day to within the last seven or eight weeks, by hand-drilling, but the rock was of such a character that it would have discouraged the most persistent set of men in the State. So slow was their progress that the distance made in the face of the tunnel for a month could be reached with a 10-foot pole. The company finally adopted one of Messrs. Severance & Holt's diamond drills, at a cost of \$4,000. After many delays of an unavoidable nature, such as bad roads, caused by the inclemency of the weather, this drill was put in successful operation, and is making from $2\frac{1}{4}$ to 4 feet per day, with three shifts of eight hours each, in the kind of rock above mentioned. The drill is run by a hurdy-gurdy wheel, placed on the rear of the drill-carriage, which is driven by hydraulic pressure. The water is conducted 3,000 feet, through an 11-inch pipe, to the mouth of the tunnel, under a 274-foot pressure; from the mouth of the tunnel to the drill at its present position, 925 feet in, by a 7-inch pipe; there it is thrown into the hurdy-gurdy wheel, 4 feet in diameter, through a $\frac{7}{8}$ -inch nozzle which runs the drills, two in number. The blasting-agent used is giant-powder. The exploding is done by a "Fields electric battery," at the mouth of the tunnel, conducted by an insulated wire the whole length of the tunnel. Eleven men are employed in the mine.

In regard to the operations of the North Bloomfield Gravel-Mining Company, the Nevada Transcript says:

During the past year the North Bloomfield Gravel-Mining Company have extended their enterprise, until now they employ four hundred and fifty men, and they expect to add considerably to this force for the purpose of extending their ditch down into Bridgeport township. The operations of this company extend from Bowman's dam to Lake City, and they have given life and energy, more or less, to the business of every mining-camp within the range of their operations. They now have one hundred and fifty men employed at Bowman's, and the dam will, it is expected, be completed in two weeks. Their ditch conveys water from this dam to the township of Bloomfield.

The most important work of the company now is the bed-rock tunnel, which is to open the basin or channel at Bloomfield. This channel was opened to the bed-rock, 208 feet, and found to contain pay-gravel from the surface down. The company, having ascertained this, determined to run a bed-rock tunnel from Humbug Cañon to their claims, that sufficient fall might be obtained to work to advantage. The surveys were made by Hamilton Smith, superintendent of the company, and the work commenced about the 1st of last May. The tunnel will, when completed, be 8,000 feet in length. The mouth of the tunnel is 440 feet lower than the channel, and will, at the upper end, be about 75 feet lower than the gravel. A road was built by the company along the line of the tunnel, and eight hoisting-works put up, numbered from 1 to 8 inclusive, coming from the mouth of the tunnel. They are all built on the same plan, and are run by hurdy-gurdy wheels. The power is supplied from the company's reservoir, through 10,000 feet of iron pipe. The shafts are about 900 feet apart, and in all of them they are now sinking, and at the same time running the tunnel from the mouth.

No. 8 is on the rim-rock of the channel, and No. 1 the nearest to the tunnel-mouth. The shafts vary in depth from 178 to 195 feet, and the tunnel has been run 235 feet from the mouth. About 720 feet in the aggregate has been completed, out of a total of 1,550 that must be completed before the line for work upon the tunnel will be reached. When this is done the tunnel will be run from both faces in each shaft, and also work will be continued in the tunnel. It is expected that the entire work will be completed in the spring of 1875. This is to-day one of the most extensive mining-operations on the coast, and all the work is being done systematically and thoroughly. The channel to be opened is rich, and the bed-rock has only been reached for prospecting.

The principal mines on Manzanita Hill, one to two miles southwest of North San Juan, are those of the American Company, the Manzanita Company, and the Yuba Company. The average product of the American Company's mine for the past few years has been about \$200,000 gross per year; the others are not washing on the bed-rock. The bullion-yield for 1872 from the hill will approximate \$300,000. No stamps are used in gravel-crushing on the hill. There are no quartz-

mines here; the entire mining-interest is in gravel. The area of this is about one mile in length, by 600 yards in width. This is estimated as worth, for the channel unworked up to the present, \$1,000 to \$1,500 per linear foot gross; the expense of taking out the gold should not exceed 50 per cent. Water costs twelve and a half cents per inch, but contracts can now be made for less. An inch of water is usually reckoned equal to 1,000 cubic feet.

Two deep tunnels are driving on Manzanita Hill; that of the American Company on the north end of the hill, now in about 2,100 feet, has to go about 2,000 feet further (300 feet in the bed-rock) to the first shaft; that of the Manzanita Mining Company, (recently merged in the Milton Company,) on the south end of the hill, is in 850 feet from Sweetland Creek, and lacks 550 feet of reaching the first shaft, (130 feet in bed-rock.) This tunnel has been driven diagonally across the rock in a straight line, 8 by 8 feet, over 700 feet since the 1st of August, 1871. They use only single-hand hammers, $\frac{3}{4}$ -inch steel, and No. 2 giant-powder. The powder is kiln-dried before using, which is thought to be a decided advantage. The average cost of this tunnel is about \$22.50 per linear foot.

In connection with some of the mining companies, the North Bloomfield Gravel-Mining Company are extending their ditches down the ridge, and will have them in operation within two months, at an estimated cost of \$80,000. They will be able to supply an additional 2,000 inches of a steady stream to the mines from Badger Hill to French Corral. This nearly doubles the previous supply.

I am indebted for the information in the foregoing paragraphs to Mr. Newton C. Miller, of Manzanita Hill.

The Yuba Gravel-Mining Company has now a 30-horse engine and a pump that will raise 26 inches of water. The shaft is down 180 feet, and of this distance 6 to 8 feet is in gravel which prospects well. The first machinery used was not of sufficient power. A tram-road is being built to run wood, abundance of which is in the immediate vicinity, to the works. The mine is easy of access, and is about two miles from the town of North Bloomfield.

The possessions of the Birdseye Creek Gravel-Mining Company, (limited,) extend from near Hunt's Hill to the vicinity of Little York, and comprise all that portion of the "blue lead" at Red Dog, You Bet, and the vicinity beyond. The entire length of the company's claims is about four miles, all the bed-rock of which will not probably be seen for the next hundred years. The company is working three sets of claims, viz, the Uncle Sam, Brown's Hill, and the Neece & West. In these claims from twenty-five to thirty men are regularly employed, running from five to six hydraulic monitors, carrying from 250 to 400 inches of water each. The company is engaged in running a bed-rock tunnel to the Neece & West that will, when completed, drain both that and the Brown's Hill claims. The dimensions will be 1,100 feet long, 7 feet wide by 8 high, 260 feet of which is now completed. A hard slate-formation has been penetrated so far. The company owns also the Independence and Bunker Hill property, and extensive claims at Sweetland.

Carney & Goodspeed's cement mill and mine are also located at Hunt's Hill. They have an 8-stamp mill run by water-power, with a 24-foot hurdy-gurdy wheel on a cam-shaft, without other gearing. This mill has a capacity of, and is now crushing, 50 tons of cement every twenty hours, which averages \$5 per ton. The company have a tunnel in 800 feet, at which point they are drifting in different directions, work-

ing regularly twenty-eight men. The gravel or cement is taken out of the tunnel by car to the mill, which is located at the mouth of the tunnel. This tunnel is rather badly ventilated at present, for the reason that but 15 feet fall can be had for the water to run the air-machinery with. Different arrangements will shortly be made for better ventilation.

Brown's cement-claim is one of the first-class claims in the vicinity of You Bet. It is owned by Judge G. S. Brown, and located about a quarter of a mile south of You Bet, and adjoins the claims of the English company, or Birdseye Creek Gravel-Mining Company. The main channel cuts it from northeast to southwest. It contains about 24 acres of mining-ground. About one-quarter of the surface has been washed to within 50 feet of the bed-rock, and one-quarter of the bed-rock has been drifted over. At present it is not being worked, but it paid well when in operation. The outlet to this celebrated claim is through Wilcox's Ravine. Mr. Brown owns about 4,000 feet of this ravine, and through it eventually all that portion of the Birdseye Creek Gravel-Mining Company's ground underlying the town of You Bet will have to be worked. From 1,500 to 2,000 acres more of mining-ground, lying in the direction of Chalk Bluff, will have to be worked through the same ravine. This claim has been worked successfully since 1865, and up to July, 1870, over \$600,000 in gold was taken from it. Mr. Brown also owns an 8-stamp mill for crushing cement, which is run by a hurdy-gurdy wheel using 50 inches of water.

Mr. H. Powell writes from Birchville district:

The area of the auriferous deposits of this district averages one mile in length, 1,000 feet in width, and 80 feet in depth. About one-half of this has been worked, at an average yield of about thirty cents per cubic yard gross, and about fifteen cents net.

There are no quartz-mines in the district. There is in the course of construction, and now nearly completed, a tunnel in blasting-rock, of 2,300 feet in length. This is the only work of importance done this year in the district.

The ruling rates for water are twelve and a half cents per inch for ten hours' run. The prospect is at present that water in the future will be ten cents per inch for ten hours.

YUBA COUNTY.

The principal mining of Yuba is at the extensive hydraulic mines of Smartsville and vicinity, which are owned and worked by five different companies, the Pactolus, Rose's Bar, Blue Gravel, Blue Point, and Smartsville Hydraulic Mining Companies. The Pactolus Company has just completed, at a cost of \$75,000, a bed-rock tunnel, 1,200 feet in length, upon which it has been at work for the last six years. This tunnel works the ancient-river channel which runs through this section, and which, in the Blue Point Company's ground, being opened deep enough to work to the bottom of the old-river bed, has paid over \$1,000 per day's washing, and, during the present year, as much as \$115,000 for less than one hundred days' washing. A shaft has been sunk on the Pactolus mine preparatory to opening the same channel.

The Rose's Bar Mining Company adjoins the Pactolus on the east. This company is also running a tunnel to work the deep channel. The tunnel will be 1,000 feet long. It has been in progress nearly three years, and is completed to about 800 feet. It will probably be completed within the present year. The company is now working the upper strata at a profit.

The Blue-Gravel Company is hydraulicking down the mountain south of these old-river claims. Its lower tunnel has been completed, after five years' labor and the expenditure of some \$60,000, and it is now

opening to the bed-rock, having a bank of some 30 feet of gravel to work, which could not be worked through the first tunnel.

The Blue Point Gravel-Mining Company, situated on the old-river channel, the tunnel to work which cost \$146,000, has, during the past year, taken out gold at the rate of \$1,000 for each day's washing.

The Smartsville Hydraulic Company still continues working on the upper strata, only stripping the surface gravel and cement off the old-river channel. It is now working a bank of cement 180 feet in height, all of which has to be blasted. The company pays \$140 per day for water, and \$1,000 per month for powder, but yields regular dividends to the stockholders.

At Mooney Flat a tunnel is in progress which will give an outlet for a large area of gravel-country that has prospected well. It will require about three years to complete this tunnel and open the ground.

Mr. D. W. C. Gaskill, of Forbestown, furnishes the following information relative to hydraulic mining operations carried on with the supposed disadvantages of slight fall:

The Ohio Flat Mining Company's claims are situated in Yuba County, near Forbestown at the head of a large flat, two miles long, with a very slight grade all the way. Our claims are 2,787 feet long, pay-dirt 300 to 400 feet wide, on bed-rock covered by 15 feet of a sedimentary clay-deposit, and 15 feet of vegetable mold, &c. We were compelled to commence a mile below our ground, on the surface of the flat, and pipe out a cut, laying our flume—2½ by 4 feet—on an inch grade to the rod. We were four years in piping out the cut and laying the flume, at an expense of \$25,000. As the cut deepened to 20 and 30 feet, quicksand in the bottom, and the sliding in of the sides, gave us much trouble. In places the cut is 500 feet wide on the surface. With 500 inches of water there is no trouble in the flume carrying off all the top dirt from two pipes. When we clean up the bottom, which we do in summer—piping off top dirt all winter—we fork all the gravel that we can from the ground-sluice, letting as little heavy gravel as possible go into the flume. The flume is 4 feet in the soft granite bed-rock in the claim, and the pay-gravel is from 1 to 3 feet deep. As fast as the dirt accumulates around the mouth of the flume we add boxes, until we have on about 500 feet, and we have now as good a dump as ever and no trouble with the flume. We are now making our third clean-up. The first year we took out of 150 feet square of ground, \$16,000; the second year, \$19,000; and a good showing for \$25,000 this year.

We have twenty years of as good or better work ahead. This is the result of *our experiment*. Novices alone would have undertaken such a job. A scientific man would never have considered it practicable or invested a cent in such an enterprise.

The Marysville Appeal, of recent date, thus notices the resumption of operations on the quartz-ledges of Brown's Valley:

Some years since the quartz-mines at Brown's Valley, Yuba County, ranked among the best in the State, and yielded largely, but for various reasons, principally the general demoralization in the mining-share market a few years since, active operations were suspended, and these mines have for several years been lying idle. Recently a new organization has been formed under the name of the Brown's Valley Consolidated Mining Company, for the purpose of working those mines, and it has purchased the Jefferson, Pennsylvania, and Danebroke mines. The Jefferson, previous to 1865, paid large dividends. The Pennsylvania and Danebroke, located contiguous to the Jefferson, have taken out large amounts of gold, but we believe have not paid dividends. During the last month active operations have been resumed on these mines by the Brown's Valley Company, and we have good grounds for indulging in the hope that the results may amply reward the enterprise of the parties interested, and also restore the Brown's Valley mining-interests to the relative positions that they deserve. The new company is composed of San Francisco and eastern capitalists. The general superintendency of the mines is vested in Baron Von Stech, an eminent mining-engineer of great experience. The principal point of present operations is at the incline No. 1, of the Pennsylvania mine, where new and stronger hoisting and pumping works are being constructed. Knowles's patent self-acting pumps, capable of throwing 20,000 gallons per hour, are being introduced, and are supposed to be of sufficient capacity to free the mine from water during the time required to make repairs on the machinery. It is the intention of the company to retimber the inclines, sink them deeper, and extract ore from the bottoms of the shafts and from the side drifts. It will probably require some two months' time and the expenditure of some \$25,000 to get these mines

in working order, by which time the mill of 16 stamps will be ready for work, and it is anticipated that a plentiful supply of ore, yielding \$20 per ton, will be obtained to keep it constantly employed. Large quantities of ore are known to exist in these mines, and it is proposed to work them up to their full capacity. Should the yield of ore be in excess of the capacity of the mill for crushing it, the company will erect one of Whelpley & Storer's ore-crushers and two pulverizers at hoisting-works No. 2, where there are now an engine and other appurtenances, which, with the proposed machinery, will give an additional crushing-capacity of 50 tons per day.

The Danebroke will be re-opened by a perpendicular shaft 150 feet in depth, which will strike the mine below the old works at a place where the vein of the Danebroke and Pennsylvania come together. From these works the drifts south into the Pennsylvania will open this mine at the place where the Pennsylvania hoisting-works No. 2 now stand, and where the mine was formerly opened by an incline 300 feet in depth. The new machinery is building at the Marysville Foundry. The re-opening of these valuable mines is a matter of great importance to Yuba County, and the company has the best wishes of the community in the success of an enterprise that will redound to the common benefit.

BUTTE COUNTY.

Cherokee.—The Table Mountain, in Butte County, is a prominent landmark in Northern California, and undoubtedly the finest representative of a basaltic covered table-land in the State. This formation rises to view on the northern bank of Feather River, opposite Oroville, and extends, as the eastern rim of the Sacramento Valley, up to Cherokee, a distance of eight miles.

Stratified gravel, beginning with the blue lead in the bottom, and rising in gradations to a height of 500 feet, forms the main bulk. Quartz-gravel and sand predominate so much that about three-fourths of the whole formation is composed of them.

The plateau of Table Mountain is a plane, with a double inclination, from north to south and from east to west, and covered with a basaltic cap from 50 to 80 feet in thickness. This basalt cover has been removed by the action of water at different localities, principally at Cherokee and Morris's Ravines, and hundreds of acres of the richest gravel-deposits were thus exposed to hydraulic action.

The isolated and elevated position of Table Mountain made the introduction of water a most difficult and expensive operation. It was, however, successfully done; and not only Cherokee can boast of stupendous water-works, introduced by the Spring Valley Canal and Mining Company, and already described in former reports, but also Morris's Ravine can lay claim to the same improvements, introduced by Messrs. Hendricks & Co. to their extensive and rich mine at said place. The reputation and public recognition of the almost unequalled mining-resources of Table Mountain and vicinity are principally due to these two great aqueducts.

Ever since mining commenced on the Table Mountain gravel-deposit, (at Cherokee,) diamonds have been found in panning the residue of the washings, either of a common gold-rocker or of the gigantic sluices of the present day. The diamonds are of excellent quality, and vary in weight from $\frac{1}{4}$ to 2 carats, a few having been found weighing about 5 carats. It is hardly possible to discover the particular stratum which contains them; but Mr. Charles Waldeyer, to whom I am indebted for these notes, believes, according to former observations, that they occur the oftenest where a small deposit of highly-colored yellow clay and siliceous breccia is found. Still there is evidence that diamonds were found in the blue gravel close to the bed-rock.

So far little has been done to save diamonds, partly for want of proper advice and partly for the reason that all attention was absorbed in gold-washing.

The principal mining-operations at Cherokee are carried on by the Spring Valley Canal and Mining Company, the Cherokee Mining Company, and the Cherokee Flat Blue-Gravel Company.

The Spring Valley Canal and Mining Company has expended in improvements, altogether, the enormous sum of \$680,000, of which \$500,000 were expended, since the spring of 1870, for introduction of water through pipes across the West Branch, and for reservoirs, ditches, tunnels, flumes, &c. The Cherokee Mining Company has expended in improvements the sum of \$400,000 for ditches, reservoirs, and tunnels, including a ditch from Butte Creek, destined to furnish water through a long line of iron pipes. The Cherokee Flat Blue-Gravel Company has expended the sum of \$175,000 for tunnels, shafts, incline, &c., and intends to introduce water from the North Fork of Feather River. Besides these larger sums at least \$50,000 were expended by other mining companies, so that the total expenditure for improvements at Cherokee may be put down at \$1,305,000.

The mining-season for the Spring Valley Canal and Mining Company was reduced to about six months—the break of an immense reservoir at Concow Valley causing the loss of three or four months' water. The result of hydraulic washings during these six months is reported at \$225,000.

The Cherokee Mining Company, depending, so far, altogether on rain-water caught in large reservoirs, cleaned up \$100,400 during the season.

The yield of other mines at Cherokee may be placed at \$25,000, so that the results of about six months' washing amount to \$350,000.

With the introduction of water by other mining companies, in quantities sufficient to work the whole year, the product of the Cherokee mines can be raised to at least \$1,200,000, if not \$1,500,000.

Morris's Ravine.—This camp, a few miles south from Cherokee, is situated in a bend of Table Mountain. Ever since the earliest times of gold-mining, in California, Morris's Ravine has been celebrated for its richness. The great drawback to mining on a large scale has been the scarcity of water, and it was left to Messrs. Hendricks & Co. to remedy this deficiency.

These mines are in the same great gravel-deposit which forms the Cherokee mines, but have the advantage of lying deeper in the basin or channel, and carrying, therefore, very large nuggets of gold. Pieces weighing from one to six and ten ounces are picked up almost every day, and perceptibly increase the profits of the miners.

The systematic opening of this mine is now in progress. One of the best tail-flumes ever built in the State is just completed. This flume is 6 feet wide, 3 feet deep, and a mile in length, provided with undercurrents, drops, &c., and paved with stone.

Messrs. Hendricks & Co. expended the sum of \$318,000 up to December 1, 1872, on this great enterprise. The following statement gives interesting and valuable details:

DITCHES.

Main Ditch, commencing at point on West Branch of Feather River, near section 9, township 24 N., range 4 E.:

Grade, upper line, 12.8 inches per mile.

Grade, lower line, 6.4 inches per mile.

Size upper line 5 feet wide, 2 feet deep.

Size lower line 6 feet wide, 2 feet deep.

Length, total, 34 miles.

Cost, total..... \$119,400 00

74 MINES AND MINING WEST OF THE ROCKY MOUNTAINS.

Glen Beatson Ditch, from Glen to mine:

Length, 6 miles.

Cost, (grade and size same as above)..... \$11,750 00

Oregon Gulch Ditch, from Cañon Ranch:

Length, 6½ miles.

Cost, (same grade and size)..... 5,000 00

Total length of ditches, 46½ miles.

Total cost of ditches \$136,150 00

Average cost per mile, \$2,928.

Average cost per rod, \$9.15.

PIPES.

Length, upper line, (réservoir,) ¾ of mile.

Length, Table Mountain réservoir, 1¼ miles.

Total, 2 miles.

Diameter 22 inches; lowest depression 310 feet.

Iron, size for pressure up to 150 feet, No. 16.

Size for pressure, from 150 feet to 250 feet, No. 14.

Size for pressure, from 250 feet to 310 feet, No. 12.

Head of upper line 40 feet above outlet.

Head of Table Mountain line 50 feet above outlet.

Cost, per foot, \$2.86; total, (including making, grading,
and putting down) 30,200 00

FLUMES.

Length, estimated, 4 miles.

Size, 5 feet wide, 2 feet deep.

Grade, same as ditches.

Cost per foot, 95 cents; total cost 20,100 00

Tail-flume, for outlet from mine, down Morris's Ravine,
(with three undercurrents,) to Feather River:

Grade 5½ and 6 inches in 12 feet.

Length, 1½ miles, (nearly 1 mile completed.)

Size, 6 feet wide, 3 feet deep.

Size of each box 16 feet; 330 boxes in 1 mile.

Lumber, each box, 1½ inches for sides and bottoms.

Lumber, total, in each box, 590 feet.

Pavement in each box 10 inches deep of rock.

Pavement, total weight of each box 6 tons.

Total cost to date, (not completed) 24,200 00

Total cost of permanent improvements 210,650 00

MINE AND EXPENSES.

Location, Morris's Ravine, Butte County, sections 17, 20,
and 29, township 20 N., 4 E.:

Incorporated at Indianapolis, May 28, 1866.

Expended for claims, water-rights, &c ... \$15,000 00

Repairs of ditches, pipes, and pumping .. 24,000 00

Developing mine and current expenses... 68,350 00

107,350 00

Total investment 318,000 00

Large as this outlay may seem, there is hardly any doubt that in a comparatively short time the productiveness of the mine will afford a yearly equivalent for its whole cost, and the extent of the ground being not less than a thousand acres, promises to repay the investment many times over.

Oregon Gulch.—The following interesting report on the quartz-mines of Oregon Gulch, in this county, was prepared by Mr. John Nisbet, of Oregon City, a resident miner of long experience:

The Oregon Gulch quartz-district occupies an irregular valley, sloping to the south, and opening on Feather River, about three miles above Oroville. It is bounded on the west by the table-land, on the east by the North Fork of Feather River, and drained through its entire extent of eight miles by Oregon Gulch and tributaries. From the main river on the south, to the West Branch at the north end of the district, can be traced croppings of gold-bearing quartz for a width of about two miles. The developments already made seem to show the existence of one or two continuous veins, with cross-veins intersecting at every possible angle.

The first company operating on the south is the Oroville Gold and Silver Mining Company, recently re-incorporated as the Minerva Gold and Silver Mining Company of San Francisco. The property comprises a number of different ledges, some of which contain rich but very refractory ores. This difficulty has, in a great measure, been overcome by the introduction of Paul's process, which has been in operation several weeks,* and gives great satisfaction to quartz-men in our district, and seems to aim at all that is possible in the mechanical treatment of sulphureted ores. The Minerva company had a 12-stamp mill, using copper plates, blankets, pans, &c., and with the aid of the new process alluded to, and the abundance of quartz at hand, expect to make large returns for the ensuing year.

The next company, about one mile north, is Grummet and Stemple, formerly working arrastras, but now erecting a 5-stamp water-power battery. They have been taking out, all summer, quartz that will yield over \$20 per ton. The gold is entirely free, and they have no difficulty in saving it by the ordinary process.

Farther north, on the west bank of the gulch, is the mine of Perkins & Reese, which has yielded rich rock, of which there are about 200 tons on the dump. It has the same general characteristics as other quartz in the district; the course and dip of the vein also indicate that it belongs to the main lead that runs through the district. This company is putting up an 8-stamp mill, using water-power at first, and steam-power, if required, in the dry season.

Farther north, about four miles from the river, where the creek bends to the east, is Oregon City, a village that gives its name to the district. Here are the Nisbet company's mine and mill. The claim is 3,600 feet along the course of the vein, covered by a United States patent. It embraces the White & Nutter, the Buffalo mine, on the main lead; the Cambria, a cross-vein from the west, and the Ned Lewis, another cross-vein from the east. These, with the exception of the Ned Lewis, have been worked to a depth of 120 feet. The Buffalo has yielded, to date, \$130,000; the Cambria, and White and Nutter about half as much each, making a total yield of \$260,000 for a vertical depth of less than 100 feet. The company has completed a new 16-stamp mill, on the site of the 8-stamp mill burned the previous year. It has two 20-horse engines, and two boilers are to be employed, one engine to hoist and pump, the other to run the battery. The free-gold ores are amalgamated in the battery discharging on silver and copper plates, with quicksilver-riffles and blanket-slucies. The blanket-washings, after natural oxidation, are ground in arrastras connected with the counter-shaft of the battery-engine. Next summer a furnace will be put up to roast the sulphides. Meanwhile, present arrangements are considered adequate to treat the oxidized ore near the surface. Last summer the company sunk the main slope over 100 feet in hard rock. Previous to this all the work had been in the overlying soft schistose rock, on a vein averaging 3 feet thick. After sinking, a level was run to the north, and the same vein was struck that paid so well in the softer rock above. The Ned Lewis mine has been worked to some extent; but water interfered, so that in future both mines will be worked by levels from the foot of the main shaft opening in the mill.

North of the Nisbet mine is the old White & Nutter; half a mile further is the Bloomingdale; both are on the main lead, but are not working at present. A mile further north is the Rock River, belonging to the Pioche estate, also lying idle. Next are the Louisiana and the Spring Valley Quartz mines, neither, at present, working.

The Spring Valley ledge is the largest, and probably the best mine in the district. There are 70 feet of croppings and *débris* on the slope below the vein, all of which will pay for milling. The facilities for working are excellent. The company has a United

*This is too short a time for an absolutely conclusive test.—R. W. R.

States patent, but for some unaccountable reason, best known to itself, steadily refuses to do anything in the way of developing the property.

There are other veins in the district that promise very well, but are not sufficiently worked to prove their value. As a general thing operations have ceased on the minor claims when water or hard rock was met with.

The district now contains 41 stamps, against 25 in 1871; a better spirit prevails, and more confidence is felt in the ultimate success and permanence of the business.

I am indebted to Mr. M. H. Wells, of Yankee Hill, for the following history and report of quartz-operations in Concow district:

This quartz-district embraces all the township of Concow. It is bounded on the east and southeast by the North Fork of Feather River, on the west and northwest by the West Branch of Feather River, and on the north by the Plumas County line. It is nearly forty miles long, with an average width of sixteen miles, and an altitude above sea-level of 1,800 to 2,000 feet. The quartz was first struck in 1849, when some very rich pockets were found. The first mill was put up in 1856 on the Rich Gulch divide, on the east side, by the Virgin Quartz-Mining Company. A 20-horse engine ran ten stamps and four arrastras, with stone-drags. This mill ran six years, and paid well, but the company not knowing how to manage, and paying the then high prices for labor, and having old machinery, stopped work, and most of the members left for Nevada. The mill was afterward sold and removed by creditors.

The next mill was put up in 1856, on the south extension of the Virgin mine, by the Forty-nine and Fifty-six Quartz Company. A 25-horse engine drove fifteen stamps, with four stone arrastras. The ledge had been located in the same year by Mr. Wells, who sold out his interest (one-tenth) before the mill was completed for the sum of \$35. One year later the same share sold for \$32,000. In laying a tram-way to run the quartz to the mill a very rich pocket was struck near the surface, out of which it is believed that over \$300,000 has been taken. As usual in quartz-mining in those days, the receipts were liberally expended in dividends, large salaries and wages, and grand improvements, while the bonanza continued; but when immediate profit ceased, assessments were required for dead work, and indifference, discouragement, dissension, and litigation were the result. The mill was idle eight years, was then purchased by San Francisco parties, and was burned down in 1869.

A tailing-mill was next built by G. Collins Shallcross & Wightman, containing two large ovens and six iron arrastras, driven by a 12-horse engine. This proving unsuccessful was sold and removed to Marysville.

A water-power mill was next built on a divide about a mile east of Oregon City, by Mr. Fuller. It was of improved form, with double stamp-rods, and worked well, but before doing much was burned down. The iron-work was bought by Mr. John C. Fall, who put it into another mill, erected on the Venus mine, at Oregon City. The vein proved rich, and the mill was profitable; but it was again destroyed by fire. Mr. Fall then removed the iron-work to Unionville, Nevada, when it became part of the Pioneer Mill. About \$500 in gold was found under the dies of the old batteries.

A 12-stamp mill (one pan, 25-horse engine) was erected on the Porter mine, at Jordan Hill, six miles north of Oregon City. This mill is now standing, and the only one in this district. It has paid well, but for the last eight years all operations have been suspended on account of litigation—recently compromised. The property is now owned in Marysville.

The Virgin mine was re-incorporated in 1857, and called the Venus. After the mill was burned all operations were suspended for four years. This summer S. P. Kimball, one of the present owners, opened a large shaft on the mine, 6 by 13, and timbered it for working-purposes. A mill will shortly be erected.

About all the numerous veins of this district run northeast and southwest, and dip 45° . The greatest depth reached on any of them has not exceeded 120 feet. The rock will pay, on an average, \$12, with a chance of striking rich pockets.

According to many assays from the mint and various assay-offices, the fineness of the gold runs from 755 to 790; silver is mixed with it. The base metals are arsenic with a little sulphur and very little copper.

The river-veins are worked out, except some banks of gravel, which pay \$1.50 per day to the hand. The gulches and placers are nearly all exhausted.

SIERRA COUNTY.

This county contains within its limits some of the most extensive and profitable hydraulic and drifting ground in California, as well as numerous veins of quartz. It has not heretofore received the attention it deserved, either from the press or the reports of the Mining Commissioner. This year I am enabled to present a full and accurate description and report of its resources, from the pen of Mr. C. W. Hendel, United States deputy mineral-surveyor, whose practice of his profession as civil and mining engineer, during a period of twenty years' residence in Sierra County, renders him eminently fit for this task. The calculations of yield per ton, or per cubic yard, have been made from personal knowledge or from examination of the books of the various companies.

Sierra County is situated between latitude $39^{\circ} 22'$ and $39^{\circ} 40'$ north, and between longitude 120° and 121° west from Greenwich, and is bounded on the north by Plumas County, on the east by the State of Nevada, on the south by Nevada County, and on the west by Yuba and Plumas Counties. Its greatest longitudinal distance is from southwest to northeast, about fifty-four to sixty miles, and its average transverse distance is about fifteen to twenty miles, thus including about one thousand square miles. Its lowest point is located on the North Yuba River, in its southwest corner, being about 2,000 feet above sea-level, while its highest point is the culminating rocky summit of the Sierra Buttes Mountain, near Sierra City, sometimes called the Downieville Buttes, being about thirteen miles east of Downieville, the county-seat, and about 8,500 feet above sea-level. The estimated population is about 6,000, having 2,665 domiciled registered voters. The total assessed valuation of property is about \$2,000,000. Of the 640,000 acres there were, in 1871, 22,310 acres inclosed, and 2,560 acres cultivated; of which 945 acres produced 13,441 bushels of wheat; 860 acres, 19,022 bushels of barley; 515 acres, 11,785 bushels of oats; 11 acres, 250 bushels of rye; 89 acres, 8,410 bushels of potatoes; 6,820 acres, 7,110 tons of hay. The county produced also 7 tons of beets, 18 tons of turnips, 9 tons of pumpkins and squashes, 72,300 pounds of butter, 14,000 pounds of cheese, 1,200 pounds of wool, and 3,100 pounds of honey. It had also last year, of growing trees, 7,810 apple, 5,100 peach, 981 pear, 389 plum, 390 cherry, 87 nectarine, 107 quince, 40 apricot, 11 fig, 2 lemon, 1 orange, 17 prune, 20 mulberry, 12 almond, and 20 walnut trees; 24,200 gooseberry and 11,000 raspberry bushes, and 5,700 strawberry and 1,220 grape vines, the latter producing 1,200 gallons of wine. There are 19 ditches for irrigating purposes in this county, to irrigate 320 acres of land.

The country is well timbered and rich in forests of beautiful and stately sugar-pine, (*Pinus Lambertiana*;) from 18 to 25 feet in circumference; yellow pine, (*P. ponderosa*;) little sugar-pine, (*P. monticola*;) digger or scrub pine, (*P. Sabiniana*;) tamarack, (*P. contorta*;) white fir,

(*Picea grandis*;) red fir, (*P. amabilis*;) spruce, (*Abies Pattoni*;) cedar, (*Libo cedrus decarreus*;) live-oak, (*Quercus Wislizeni*;) black oak, (*Q. Sonomensis*;) covering the mountain-slopes, from their lowest points on Yuba River and its tributaries, up to the summits of the various ridges between the many cañons, to an elevation of 8,000 feet, and all valuable for lumbering and mining purposes. There are 9 steam and 12 water-power saw-mills in operation, having produced last year 6,000,000 feet of lumber.

The climate is very salubrious, most deaths occurring from great intemperance, exposure, accidents, and violence. The spring, summer, and autumn months are similar in climate to those of Northern Italy. The excessive heat prevailing in the valleys lasts but a few days, and then only for a few hours during each afternoon. The winter-months are often very severe and terrible during the prevalence of the great storms; still, the cold is not as great as in the Eastern States in the same latitudes and at less altitude, or even at the sea-shore of the Atlantic. The snow-fall, in localities of great altitudes, is from 10 to 20 feet in depth.

Mineral resources.—In mineral-resources Sierra County may justly claim to be second to none, in fact to be the leading county of California in regard to drift, hydraulic, and vein mining. The mines were in the early days easily worked and prolific in their yield; and they still continue to be among the most remunerative and productive in the State.

Gold is found at all altitudes, from the lowest point in the beds of the rivers to the very summits of the divides. The deep beds of auriferous gravel and the quartz-deposits will not be exhausted for centuries.

Gravel-mines.—Sierra County is considered the principal drift-mining county of California. Several well-defined and far-famed ancient-river channels run across this county in a general north and south course, from 500 to 2,000 feet higher than the present parallel-running creeks and rivers—some of them so high that the introduction of water to them has hitherto been considered of doubtful possibility, and, if practicable, too costly for poor miners. It is a well-established fact in regard to placer-mining that without ditches these rich and extensive auriferous gravel-channels are insignificant in value. No gold can be obtained from them without *water*. The streams run past these deposits far below, in deep, steep, and often very abrupt cañons, which have, however, a great fall, and extend high up into the snowy regions, so that by taking the water from near their sources this indispensable requisite for hydraulic operations can be obtained. There are at present fifty mining-ditches in this county, with an aggregate length of two hundred and twenty miles, costing about \$750,000. There is still demand for more water, as the present supply lasts only from four to eight months.

Although many millions of ounces of gold have been taken from the edges of these channels, where they have overflowed their beds, they have been, so far, scarcely more than touched. The most eastern of these channels appears to come from Plumas County, in the north. It crosses Feather River near Beckwith's Pass, continues thence, in conjunction with a channel coming from the northwest, (passing Gold Lake,) as one grand river in a southwesterly course, passes the Keystone quartz-mine and Milton's Ranch, crosses the old Hennes Pass wagon-road, near the "middle waters"—having been so far but very little opened—thence along the mining-camps of Nebraska and American Hill, both of which have proved its richness, and finally on toward Eureka, south, in Nevada County, where it is extensively opened and

worked with great success and profit by many mining companies. Here the celebrated North Bloomfield Company (at an expenditure said to have been, for some time past, \$60,000 per month for labor and material alone) is now opening this channel with a bed-rock tunnel one and a half miles long, in order to work and wash out the lower rich strata of the company's extensive mining-ground, located on the above-described grand gravel-channel or dead river. This channel is in Sierra County, about twenty-five miles in length, and averages one mile in width.

The channel lying next west enters Sierra County near its northeast corner, on the dividing ridge of the heads of Hopkins and Nelson Creeks, in Plumas County, and Cañon Creek, in Sierra County; runs a southerly course, and is covered to great depth by heavy layers of lava and volcanic sand, (conglomerate,) or "mountain-cement," as it is generally termed by the miners. The main channel has been tested by partial working in the following rich places through which it passes, viz: Cañon Creek, Poker Flat, Deadwood, Sebastopol, Excelsior, Fir Gap, Monte Cristo, City of Six, Rock Creek, Forest City, West Ravine, Alleghany, Chip's Flat, and Minnesota, all in Sierra County; and Orleans and Moore's Flat, &c., in Nevada County on the south. In all these places, with the exception of the four last named, the deposit has been worked by means of shafts or tunnels, by drifting, and in most instances the front of it only has been hydraulicked, where water could be obtained, with a satisfactory result. The four last-named places are still worked with great success by hydraulic process. All these mining-camps paid richly in early days, producing many millions; and this channel has of late proved as rich as formerly wherever followed and opened low enough into the center of the overlying hills. This has been demonstrated at the mining-ground of the Bald Mountain Company, at Forest City, and the Highland and Masonic Company, situated between West Ravine and Alleghany.

This channel has several branches, which have proved equally rich in several places, as, for instance, the celebrated "blue lead" or "blue banks," near Downieville, situated on the left bank of the North Fork of the North Yuba River, which is apparently a different gold-bearing channel from that of the ancient-river beds before described.

Without its branches the above-mentioned channel is over twenty miles long in Sierra County, and more than one mile wide, containing an area of over twenty square miles, having a grade of 70 feet per mile in average. Farther west comes the celebrated and more extensively developed so-called "Slate Creek Basin," on each side of which is a well-proved and very rich auriferous gravel-range or dead-river channel. These run nearly parallel to each other in a southwesterly course from the northeast, uniting, however, again near Bald Mountain, in the neighborhood of Scales Diggings and Poverty Hill. The eastern of these two, lying between Cañon Creek on the east and Slate Creek on the west, apparently enters Sierra County in its northwest corner, under Pilot Peak. This isolated mountain is over 7,000 feet high, of volcanic origin, its northeastern slope heaved up and walled with basaltic columns, while its lofty summit, commanding a sublime panoramic view of the Sierra Nevada Mountains for hundreds of miles distance, Sacramento Valley, and the Coast Range, is capped with a bed of lava 600 to 700 feet thick. This channel has an average fall from the base of Pilot Peak (where it is worked by the North American Mining Company) down to Scales Diggings, near the junction of the western channels, of 84 feet per mile, reckoning these two points as twelve miles apart, as they are in an air-line. The course

of the channel is, however, very crooked, like all our present streams. It passes from under Pilot Peak, through the Pilot Company's claim, where it has also been recently discovered in their late and lowest tunnel, at a distance of 800 feet from its mouth, and at an altitude of about 6,400 feet above sea-level. It then passes through the North American Company's claim, a consolidation of many well-known mines, containing 284½ acres of very valuable and rich mining-lands, which has already yielded \$325,000 to \$350,000 from one-fiftieth of the whole area, and was purchased a year ago by an English company. Thence it passes eastward, east of Slate Creek House, the head of Slate Creek, near or under Staffa Mountain. Here it takes a southeast course under Mount Fillmore or Alturas Mountain, where its existence has already been proved by a tunnel driven on the east or Cañon Creek side by a German company. This tunnel proved, however, to be too high, and a new one has since been started much lower and is expected to strike the bottom of this channel ere long. Thence it trends toward Table Rock, passing between Potosi and Cold Cañon, in which places it has for many years past been extensively worked with great profit by drifting in the direction quartering toward each place, or in a more southerly course. The Fashion and Sierra Companies, in Cold Cañon, have driven their tunnel southwest to reach the channel in their ground, (both companies having thus far taken out over \$750,000 of gold,) while the first companies working in Potosi had to drive their tunnels southeast to reach the same channel in their ground. The Pittsburgh and Hawkeye Companies, in Potosi, have thus far taken out over \$1,000,000 of gold. Recently the Monumental Company, also in Potosi, lying north of the former mines, has also tapped the same channel, and is now declaring dividends of \$5,000 to \$6,000 per month. The Empire Company, owned by San Francisco capitalists, lying still further north, is driving energetically toward the same rich channel known to exist in its ground.

We find this channel going thence southward toward Howland Flat, as proved by the connection of the Pittsburgh and Hawkeye Companies' underground works with those of the Union Mining Company and others in Howland Flat, at an altitude of 5,750 feet, (the town being 5,850 feet in altitude,) making a difference of elevation from the channel at Pilot Peak to Howland Flat of 650 feet. The Hawkeye Company in Potosi, in opening out its claim, ran first a tunnel, at a cost of over \$30,000, from the northwest or upper side. This proving too high to work the bottom of the ground in the channel to advantage, having no drainage, they made a drain-tunnel from the Union mine in Howland Flat, at an expense of \$20,000. But this drain-tunnel going through the so-called "swell"-rock it closed up again, soon after its completion, to such an extent that fifteen months afterward, when the Union Company crossed the line of it, no appearance of the old tunnel could be found, save the firmly-imbedded timbers. Having completed, at a cost of over \$40,000, a new drain-tunnel from the southwest, over 2,500 feet in length, the company has since worked very rich ground, having taken out as much as 80 ounces of gold per week to thirty men working.

The Union Company, also in Howland Flat, has thus far taken out over \$1,000,000, and is now driving a lower tunnel for the so-called "back channel," under Table Rock, a mountain 7,200 feet in altitude. The front ground of Howland Flat has all been drifted out, having yielded several millions. This ground has, of late, been consolidated into one company, known as the Last Chance Placer-Mining Company; and an application for a United States patent to the lands (33 acres) has been made. In the report to the United States surveyor-general of

California, by the United States deputy mineral-surveyor, C. W. Hendel, who made the survey of said mine under special instructions of September 28, 1872, he says:

This mine is a consolidation of the once celebrated rich mining-grounds of the following mining-companies, viz, the Saint Louis, Golden Gate, Minnesota, Wabash, and other companies now defunct, which have spent not less than \$50,000 in opening the ground, either by tunnel or shafts; and it is believed that not less than \$1,000,000 in gold-dust has been obtained from the bed-rock, while the remaining top-gravel, which is about 50 to 60 feet high, to near the surface, will pay a large sum of gold by working by hydraulic process. The whole bank being an auriferous gravel-deposit, containing plenty of free gold throughout, to near the surface, which is covered by a bed of heavy lava, tufa, or volcanic sand, offers excellent opportunity for hydraulic mining. This mine is but a small portion of the celebrated gold-bearing gravel-channel or ancient-river bed, which comes from Pilot Peak in a southeasterly course, and extends through Sierra County, by way of Pine Grove, Chandlerville, &c.

This channel is then traced further south by its exposed edges in several places on each side, having been worked with great profit by either drifting or hydraulic process in the camps of Pine Grove, Rabbit Point, Chandlerville, Sacket's Gulch, Saint Louis, Greenwood, Cedar Grove, Gardner's Point, Grass Flat, Slopeville, Queen City, and Portwine, all on the west side of the channel; by two mining companies east of Howland Flat, and at Wahoo on the east side.

At Pine Grove, the Comet is the only company at present working. It does not use the late and most approved appliances, which have, within a few years, made a revolution in hydraulic mining, by which this branch of mining has become a regular and legitimate business.

Notwithstanding this drawback, and the fact that the shareholders, who are in this case the workmen, receive higher wages than is customary for hired help in the same locality, they have been washing their ground by hydraulic process with considerable success. They have, in 1872, sluiced away a piece (a great part of which had been drifted out by former companies years ago) containing 33,970 square feet or 1,188,950 cubic feet of ground, (the bank being about 30 to 35 feet deep at present,) by using only 300 to 500 inches of water, for which they paid this season's rent, \$4,250, at the rate of \$40.85 per cubic yard of gravel throughout. Allowing 150 pounds for the weight of the gravel per cubic foot, the company had moved 178,342,500 pounds, or 89,171 $\frac{1}{4}$ tons, including the immense boulders which had to be turned over, and obtained a yield of \$17,921 or \$20.1 per ton. Their mining-appliances consisted of 500 feet of iron pipes, of 11-inch diameter, and 700 feet of 9-inch diameter, having a pressure of 115 feet fall. With but little expense they could have obtained over 160 feet pressure. They were using two pipes, one with a 2 $\frac{1}{2}$ -inch and the other with a 2 $\frac{3}{4}$ -inch nozzle. After the gravel-bank had been caved down by the stream of water from the pipes, the caved and broken-up gravel was carried in ground-sluices into and through 400 feet of sluices, paved with rock, set on or above the bed-rock, thence dropping down a perpendicular shaft, 25 feet deep, into their sluice-tunnel, in which they have a flume 2 $\frac{1}{2}$ feet wide by 2 $\frac{1}{2}$ feet deep, set at a grade of 1 foot in 12, paved also with rock, and 300 feet long, this tunnel having cost, on an average, not quite \$10 per linear foot. The tailings, after passing out of the tunnel, ran thence through a flume of the same size along the hill-side of Slate Creek for 300 feet, then dropped into a ravine through 100 feet of ground-sluice, where they are yearly worked over again by other parties, with excellent results, and are finally carried into Slate Creek, as are all the tailings from the surrounding hills. Here they lodge and are carried off by freshets, to some extent, into the Yuba.

The gravel-claims of this place and the surrounding country are of the class known as deep-placer or drift diggings; their value depends upon the richness of an auriferous stratum covering the bed-rock to a greater or less extent. In the Pine Grove mines this stratum is about 20 to 30 feet thick. The bed-rock on which this pay-streak rests is soft yellow metamorphic slate, having a blue color a few feet below the surface, and becoming hard in going down. The appearance of the gravel in all these mines is very favorable for hydraulic mining, unless too much lava or barren top-dirt makes it unprofitable to "pipe off" or strip. In that case it must be worked by drifting, in the progress of which it is generally the case that the pay-stratum becomes thinner, but richer in gold on the bed-rock per cubic foot. The open banks show a beautiful quartz-wash. The gravel is mingled quite freely on the bottom with smooth-washed quartz-boulders, weighing often some tons, well rounded; and the remainder is composed of smaller, well-washed, round, and smooth quartz-pebbles, mixed in yellowish and whitish clay, sand, and other earthy matter. The rocks, when taken from their virgin places, leave a smooth bed behind, a sign which is held by all observing miners as an indication of rich pay. The gold is about .910 to .920 fine. At Chandlerville, now mostly owned by the Sears Union Water Company, under the management of Mr. George Cox, that company worked, last year, gravel considered the poorest in the neighborhood for miles around, being so hard that only the best kind of a hydraulic ram, "Chief" or "Dictator," would make an impression in their gravel or rather cement (conglomerate) bank, and paying only 7 cents per cubic yard; but they washed such an enormous body of ground that they still realized a handsome dividend over and above getting paid for their water, where other parties before them, even in somewhat richer ground, but with no business qualifications, could not make expenses under the old system of working, and in consequence had become bankrupt. This company uses a flume 5 feet wide, 3 feet deep, set in a bed-rock cut and tunnel, at a grade of 6 inches in 12 feet, using 1,200 inches of water, part of it running through a 15-inch pipe, made of No. 16 sheet-iron, with a 4½-inch nozzle, and a Dictator with an 11-inch inlet, under a pressure of 150 feet. They have also an old-fashioned 3-inch nozzle, throwing 300 inches of water. A few white men, at \$3.50 per day, are employed to oversee the Chinese laborers, who only receive \$1.40 per day, to wheel up into the ground-slucies the balance of the gravel on the bed-rock. In eleven weeks' run this company moved 350,000 cubic yards of gravel, the bank being only about 25 feet high.

At Saint Louis, where, in former years, the ground was owned in very small parcels by many companies, about two dozen of which were usually at work by hydraulic washing, the ground has of late been more consolidated and reduced to about half a dozen ownerships, claiming from 300 to 500 acres of mining-land. Four of these companies, possessing all the water-privileges, are Morgan & Co., Emory & Co., Stahl & Brother, and McCrory & Co. They are beginning to use the modern appliances for hydraulic mining, having ground enough left for fifty years, which will pay from \$2,000 to \$10,000 per 100 feet square.

At Greenwood, and adjoining Cedar Grove, are the Star, Caledonia, and Exchange Companies, having a frontage of about 4,000 feet on this channel, and running into the main channel, which is at this point about one and a half miles wide between Slate and Cañon Creeks. The front ground of Cedar Grove paid well in early days for washing in sluice-boxes. McCrory & Co. took out from 1½ claims (at 100 feet square) in one season \$42,000, and out of 1½ claims \$30,000. There have been over

\$250,000 taken out from about 12 acres of low ground in that place, from banks not over 40 feet deep.

At Gardner's Point, formerly a mining-camp of some note, having yielded about \$500,000 of gold, but dormant for about ten years, the property was lately purchased by Colonel B. F. Baker, from the San Francisco owners, for the sum of \$3,000, and consolidated with surrounding mines. The purchaser had last season hardly time to repair dilapidated ditches and old cuts; but by using proper hydraulics and patching up ditches, &c., he managed to wash a piece of ground of 100 feet square. There were about 5 feet of soft blue gravel on the bed-rock, and on top of that about 45 feet white gravel, mixed with blue quartz-boulders, all washed smooth and well rounded, and 30 feet of soft lava on top of that, making the face of the bank about 80 feet high. Out of this piece he realized, at the expense of a few thousand dollars, the sum of \$30,000. In this claim he found two diamonds, the first of which was, it is said, lost by his foreman, who did not know its value, while the second and smaller one, found and preserved by Colonel Baker, has been pronounced by lapidaries a diamond of the first water without any flaw, and valued at \$165.

Thence we trace the channel through Grass Flat, where it is over one and a half miles wide, and where the Pioneer Company and others to be consolidated have made an application for a United States patent to 360 acres of mining-lands, which they own. This company is now running its third tunnel, having made the common mistake of starting their former tunnels too high and running them only for drifting purposes on a small grade. It now becomes necessary and very remunerative to work this mine, and afterward the whole district to the north, containing over 1,000 acres, through the outlet of the tunnels, by drifting or hydraulic process as the case may be. This can be done with a deep tunnel by following the channel up with cuts or tunnels, having the great advantage of soft rock and its natural grade from north to south, instead of running a separate tunnel through the hard rim-rock for each company, at an enormous expense. Mines in a contiguous row on the same channel are too often worked independently, while one general tunnel, following the channel, would allow the water to run off by its natural flow to the lowest from all the mines, at great saving of expense. The Pioneer Tunnel would be the nearest and most accessible outlet for a large range of country on the channel. The claims of the Pacific, Union, and Monte Cristo Companies, containing hundreds of acres, lying south of Grass Flat, and having poor facilities for drainage, could all be washed through this tunnel by the hydraulic process, since their bed-rock, strange to say, pitches heavily toward the north. Unfortunately the Pioneer Company went to work with false economy, without proper surveys, which, compiled and studied by an experienced engineer, would have established to a certainty the bearings and differences of grade of the different channels. They have lately consulted an engineer, to ascertain how much lower they could start a sluice-tunnel, and its necessary length; and the result is that after blasting a tunnel 1,500 feet through very hard rock, costing on an average \$20 per linear foot, and yet worthless for hydraulic purposes, they find that they could have run a sluice-tunnel, for nearly the same amount of money, more than 150 feet lower, by commencing a few hundred feet southwest of the mouth of the old one, and that by the surveyed route the deep tunnel would have been only 276 feet longer. The rock would have been more favorable, not costing over \$15 per foot; and a splendid sluice-grade would have been obtained, with the drainage

of a section of mining-ground not to be worked out for many years. The present tunnel started over ten years ago, cost over \$60,000, and is now 3,500 feet long and nearly 3,000 feet in the above channel, with gravel now demonstrated to a certainty to yield great profit when sluiced away by hydraulic process. The first shaft raised for air from the branch tunnel, about 900 feet from the mouth of the main tunnel, passed through 58 feet high in gravel, with the 5 feet of loam on the surface, and the second air-shaft, in the main tunnel, 1,680 feet from its mouth, passed through 80 feet of gravel, with 6 feet of loam. The gravel in these shafts contained free gold; and throughout the whole mine, as prospected, it is heavily impregnated with gold-bearing sulphurets, these having assayed as much as \$160 per ton. The branch tunnel, where in gravel, for a distance of 421 feet and 18 feet above bed-rock, paid an average of 86½ cents per cubic yard; and for 1,200 feet in the main tunnel, where the same has been excavated in gravel, (over half the distance being about 10 feet above bed-rock,) the gravel paid an average of \$1.04 per cubic yard, notwithstanding the gold could not all be obtained. The difficulty is that the gravel is loose, the free gold easily washed, and the ground very wet, (over 50 inches of water running out of the main tunnel in the driest time of the season;) hence, before the gravel is shoveled into the cars, the gold has already to a great extent been washed down to the bottom of the tunnel. This company recently let another contract for 500 feet of tunnel, expecting to strike into the richest part of this great gravel-channel, worked by more than six companies farther south toward Portwine, and also by this company on its north side, and having paid as high as \$2.12 per cubic yard.

Farther south from Grass Flat we have in operation the Union Company, north of Portwine, which has a claim 2,290 feet long by 850 feet wide on this great gravel-channel. The ground is opened by drifts; and after having been raised in loaded cars upon a double track 96 feet in length from the incline by water-power, the gravel is transported through a tunnel, 2,500 feet, by mule-power, one mule hauling 10 to 12 cars out of the tunnel at each trip. This company has washed in ten years past 37,810 cubic yards of gravel, which yielded \$463,343.99, giving the astonishing average per cubic yard of \$12.25. The ground is very deep. A shaft, sunk in early days 209 feet deep, with 30-horse steam-power, and still prevented from reaching bed-rock by the quantity of water, showed beautiful "quartz-wash" from top to bottom.

The adjoining Monte Cristo Company on the south, on the same channel—the only company which has worked through to the east side of the channel on the Cañon Creek side—hoists the dirt to the surface by means of an incline with a 15-horse engine, and has drainage through the Union Tunnel. This company has washed in the last ten years 83,959 cubic yards of gravel, which yielded \$543,648.79, or \$6.47 per cubic yard.

In Portwine this channel has been worked extensively and profitably by hydraulic process, by the Queen, Golden Gate, Erie, Eagle, Sailor, and several French companies, having produced millions of dollars. About a mile below Portwine, at Bunker Hill, the overflow of the channel over its rim-rock is plainly seen, and has been partly worked. Thence for about four miles, toward Mount Pleasant district, little prospecting has been done.

In following the course of the channel after crossing the Gap of the summit of Bald Mountain, (5,500 feet altitude,) we pass to the right of Hard Scrabble mining-district, which is very extensive, but very little worked for want of water and capital.

Next comes Mount Pleasant Ranch mining-district lying southeast of Poverty Hill, and known to contain very deep placers, as extensive, and supposed to be as rich for hydraulic washing, as the famous Blue-Gravel mines at Smartsville, in Yuba County. The Iowa Company, in attempting to reach bed-rock, sunk a double shaft 154 feet deep, using a large overshot water-wheel; but disagreements led to bankruptcy, and the property was sold under the hammer. The new company started, without a survey, a drain-tunnel from Rock Creek, to strike the bottom of the shaft. After they had run a considerable distance, they found that they would miss the shaft 150 feet to the left, and were 12 feet higher than its bottom. This tunnel to the shaft was run 1,162 feet, at a cost of \$8,000. The company then purchased a 30-horse engine and steam-pump, and sunk the shaft to a depth of 220 feet, about 40 feet into bed-rock, at a cost of over \$18,000. Getting hard rock, they started a drift, but in 50 feet they lost the bed-rock, the shaft having been sunk on the rim-rock. After running the tunnel 200 feet from the bottom of the shaft into the hill, through gravel that prospected well for hydraulics, the company attempted to sink to the bed-rock; but when 12 feet down further progress in that direction was stopped by the inability of the workmen to get rid of the water as fast as it came in, in the back shaft, although they were able to raise some 1,600 gallons per hour. The members of the company being working-men, their means became soon exhausted, and they finally quit work, and all the mines in that district have lain dormant ever since.

Next to the Iowa Company is the Washington Company, which, more than ten years ago, ran two tunnels, and at the back end of each sunk shafts to a considerable depth, spending no less than \$25,000, but was unable to reach bed-rock.

Farther south we have the Mount Pleasant, Ladies', and Lincoln Companies. The first one of these has made a start in the right direction, by commencing a sluice-tunnel from a steep ravine emptying into Cañon Creek; to be about 1,500 feet long, and to constitute the only available outlet to drain and wash off several miles of this gravel-channel. The estimated cost was \$40,000 to \$50,000. This company being, like the rest, not abundantly supplied with money, is working but little on this great enterprise. If half the money spent in this district on petty shafts and tunnels had been used on this tunnel, opening nearly 1,000 acres, the owners of the ground would have been well rewarded.

In this neighborhood the western channel of the Slate Creek Basin unites with the main channel, which continues on its course southward to Scales diggings. Here the Cleveland and Sierra Hydraulic Mining Company is using 2,000 inches of water, and running night and day, employing twelve men. They use one of Craig's old and one of the new universal-joint pipes, with a nozzle of $5\frac{1}{2}$ inches and a stream under 200 feet pressure. This company has about 130 acres in the old channel. Where they are now working it is from 40 to 200 feet deep, and but a small portion has been worked.

The same company works another set of hydraulic claims at Council Hill, about two miles from Scales's and four miles from Brandy City, where 1,000 inches of water are used, in two streams, one with a $3\frac{1}{2}$ -inch and the other with a $4\frac{1}{2}$ -inch nozzle, (old style of pipe,) under 275 feet pressure, employing five men. The company owns several ditches supplying an abundance of water.

At Fair Play, between Scales's and Council Hill, Boyce & Brother own their own water, which is conveyed through two ridges in tunnels, one

1,000 feet and the other 600 feet long. They also own several hundred acres of rich, blue hydraulic ground.

At Brandy City, on a ridge between Cañon Creek and the North Yuba, this channel is successfully worked by Messrs. Zellerbach and Hickey, Jenkins & Co., and others. The former property was bought a year ago for \$72,000. After introducing all modern appliances the new company, sixty days after commencing work, cleaned up \$32,000. This company owns two ditches, each of a capacity of 1,200 inches.

This channel extends thence south, past Young's Hill, Camptonville, San Juan, Birchville, and French Corral to Smartsville, &c.

The most westerly channel of the celebrated Slate Creek Basin, lying between Slate Creek on the east and Little Feather River, in Plumas County, on the west, enters Sierra County (like the before-described channel) in its northwest corner, under Pilot Peak, passing from Hep-sidam along the main dividing ridge through Whisky Diggings, thence through Gibsonville. In both places the front portion of this channel has been worked with satisfactory results by many drifting and hydraulic companies. About a mile below Gibsonville, near Wallis Ravine, the Go-Ahead Company sunk a shaft 351 feet, with a steam-engine, to bed-rock. In sinking they passed through seventy-five different strata of different texture, and also found a petrified elm-tree imbedded in the gravel. This work was done under contract, to sink until bed-rock was struck, and a few pans of gravel were tested with fair results; but the bed-rock apparently pitched rapidly into the hill, threatening to require further dead work, and the members of the company being scattered, work was stopped and the shaft suffered to fill up with water.

The channel enters thence Plumas County, and for miles has not been developed until it reaches La Porte, which formerly belonged to Sierra County.

The mining-ground in and around La Porte has been more consolidated and is owned now by but few companies, who all have their own water. The principal mining companies are Conly & Gowell, Gard & Orr, Bald Mountain, and Bordwell's.

Conly & Gowell hold a large and valuable claim, by United States patent, said to be the first one ever obtained for a gravel-mine. They have expended a large amount of money on the ground. In four months' run of ground-sluicing, or hydraulic washing, they cleared off about $6\frac{1}{2}$ acres, averaging about 65 feet in depth. Allowing 150 pounds as the weight of gravel to the cubic foot, this company moved in that period the enormous amount of 1,380,807 tons of gravel and started it on its way to the Yuba River, through Slate Creek. They have an abundance of water during the washing-season, running all their pipes, using an 8-inch nozzle, and 800 inches of water, miners' measure. This is believed to be the largest nozzle in use, and is of the kind known as the Monitor. Before it the banks of gravel melt away like snow before the sun. Rocks weighing each a ton or more are moved by the force of the stream, when turned against or under them, and rolled high and dry on the bank out of the way.

Heretofore, in mining of this nature, hose and pipes were used which would carry a large body of water under a pressure of 50 to 60 feet. The Monitor will stand a pressure of 200 to 300 feet; with it miners can tear the hardest cement, even cutting a ground-sluice through the bed-rock with it, where plenty of water and pressure can be obtained. The bottom of this claim is covered with a hard cement crust, from 2 to 12 inches in thickness, resting on the bed-rock, which, before the introduction of the Monitor, was found extremely difficult to work. Moreover it

seriously impeded the saving of the gold washed out from the earth above. This cement itself is rich in precious metals, the extraction of which its extreme hardness prevented. It is a mass, formed under the petrifying influences of the water in the channel, of iron pyrites, black sand, and fine-ground or pulverized quartz. In working it with the Monitor these difficulties disappear. A stream is turned against it, striking on the bed-rock. In an instant it cuts a hole under and turns up large flakes of the cement, breaking it into fragments which are almost entirely disintegrated before they reach the end of the flume. The flume of this company is 4,500 feet long, and riffled the whole distance with stone paving. The tailings run into Slate Creek, where they are carried away to some extent by the annual floods, the residue being washed over and over again by the several companies owning and working Slate Creek for this purpose. To clean up such a flume and cut is a large job, requiring several weeks, but the most pleasing work of the miners' season. To avoid loss of time they run continuously through the season, as long as the water holds out in their ditches, cleaning up only once a year. They cleaned up last year over \$125,000 for the season's run.

What has been stated of the above mine is applicable also to Gard & Orr in the same place, who also own several hundred acres of equally rich gravel.

Next come Spanish Flat, Secret Diggings, and Bernard Diggings, on the same channel, where it makes a horseshoe bend, from which several million dollars have been taken.

Farther on this channel is found in Poverty Hill, east of Slate Creek, cut in twain by the creek. This part yielded about \$2,000,000 before it became necessary to drive costly tunnels to work the deeper and still richer channel, covering over 1,000 acres. Messrs. Judson and others, of San Francisco, are now running a tunnel 7 feet wide from Gold Run Ravine, low enough to work the surrounding country. Westall & Eberle have finished their sluice and drain tunnel, which it took six men ten years to complete, and are now piping their rich, long-neglected ground. Kingdon & Brother are profitably working their ground, as far as their small amount of fall permits. Here the channel unites with the other branch, as before described, and bears on toward Brandy City, Camptonville, &c. This channel has an average fall, from Hepsidam to La Porte, of 182 feet per mile, being seven miles long in an air-line, and on an average one mile wide, giving, in Sierra County, an area of about fifteen square miles of mining-ground to be worked in the future. In both the before-mentioned channels the auriferous gravel is exposed on the surface for many miles in Sierra County.

Fluming-claims or gravel-tailing mines.—The value of the beds of all the streams in the gold-bearing sections of the State, and particularly of the Great Slate-Creek Basin of this county, was never understood until recently. A few years ago, when the bed of a stream had been worked out, it was thought to be of little future value, and not worth working over again. Now it is conceded that tailings in the channels of the rivers, creeks, and ravines will pay to rework as often as they are filled up with gravel, cement, and sulphurets from the deep hill-diggings. This class of mining-property now proves the safest for investment. In many cases the owners are at no expense whatever; the hydraulic and drift mines above them fill up their claims gratis every year, and give them also, in most instances, free water to wash the accumulated tailings.

The ravine and creek claims are generally the first recipients of the

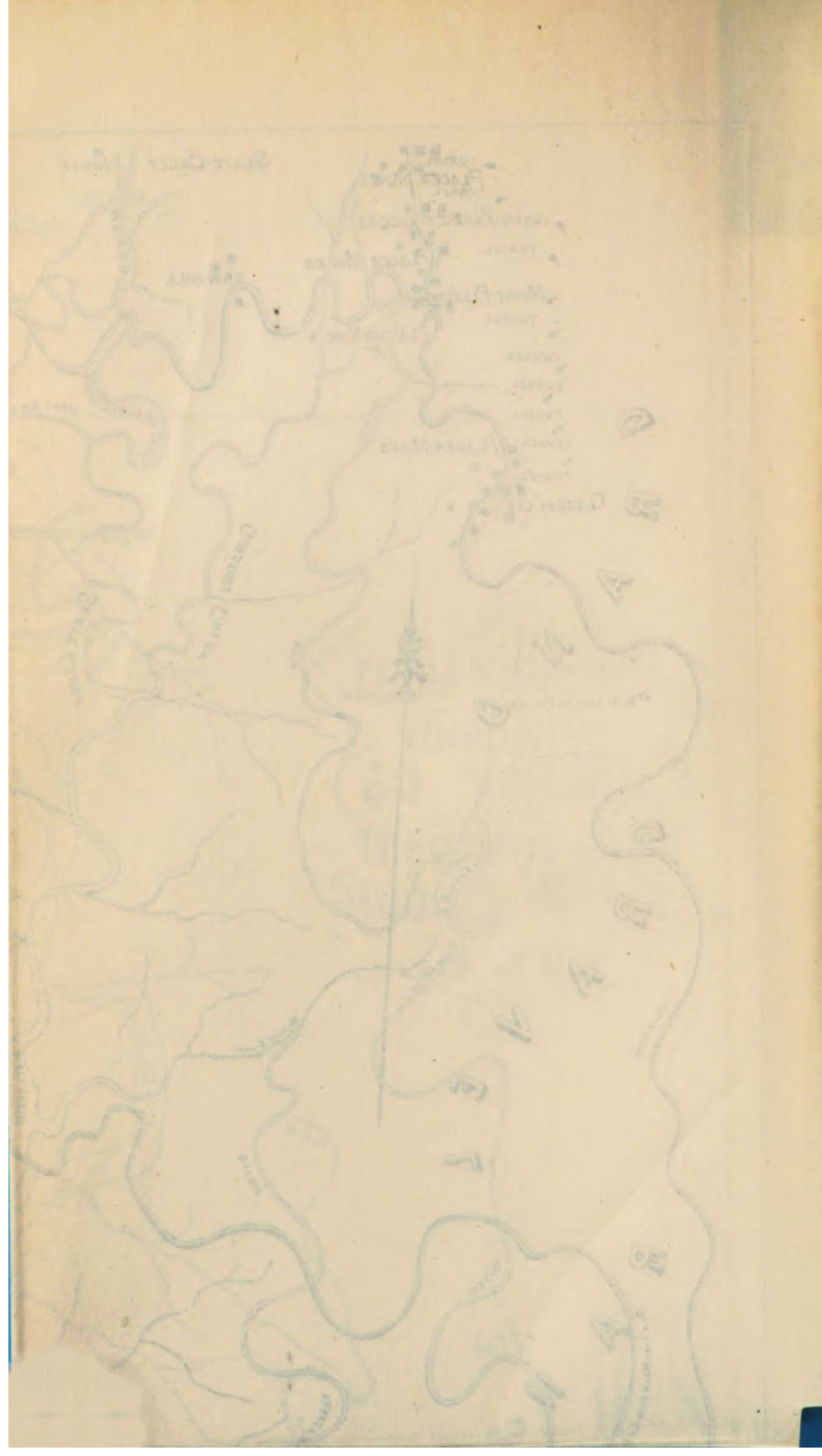
tailings from the sluices and tail-flumes. These ravines in Slate Creek Basin are generally very steep, and have a fall of 300 to 600 feet, until they reach Slate Creek, which empties into the North Yuba River.

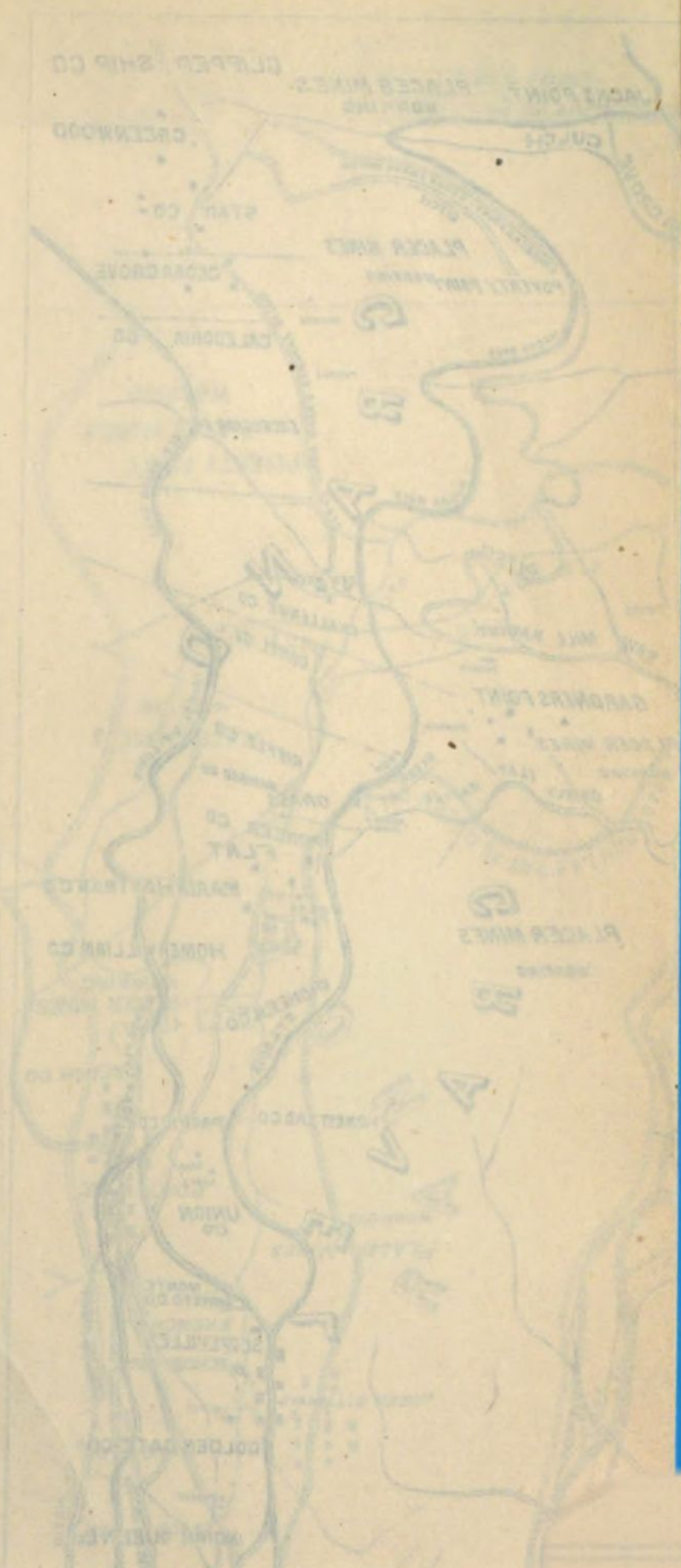
Such a ravine is found below almost every mining-camp, with about 60° descent, varied with falls over which a large body of water and gravel runs for several months of the year. The bed of the ravine, immediately above each fall, is comparatively level, or may be made so by artificial dams, and is often covered with flumes, varying in size from 4 feet to 16 feet wide, and, in some places, two flumes alongside each other, paved generally with pieces of rock. These are used for two purposes, viz, to preserve the wood-work from the gravel which runs over it, and also to act as "riffles," to save the gold. These flumes in steep ravines catch the tailings from hydraulic diggings themselves. Tailings in these creeks have always proved profitable. By miners who have used all kinds of riffles in this part of the country, those above described are considered far superior to all others in efficiency, durability, and economy. The object in using two flumes is that, when it is necessary to "clean up," the stream of water which accompanies the tailings can be used in one without inconveniencing the operations of the other.

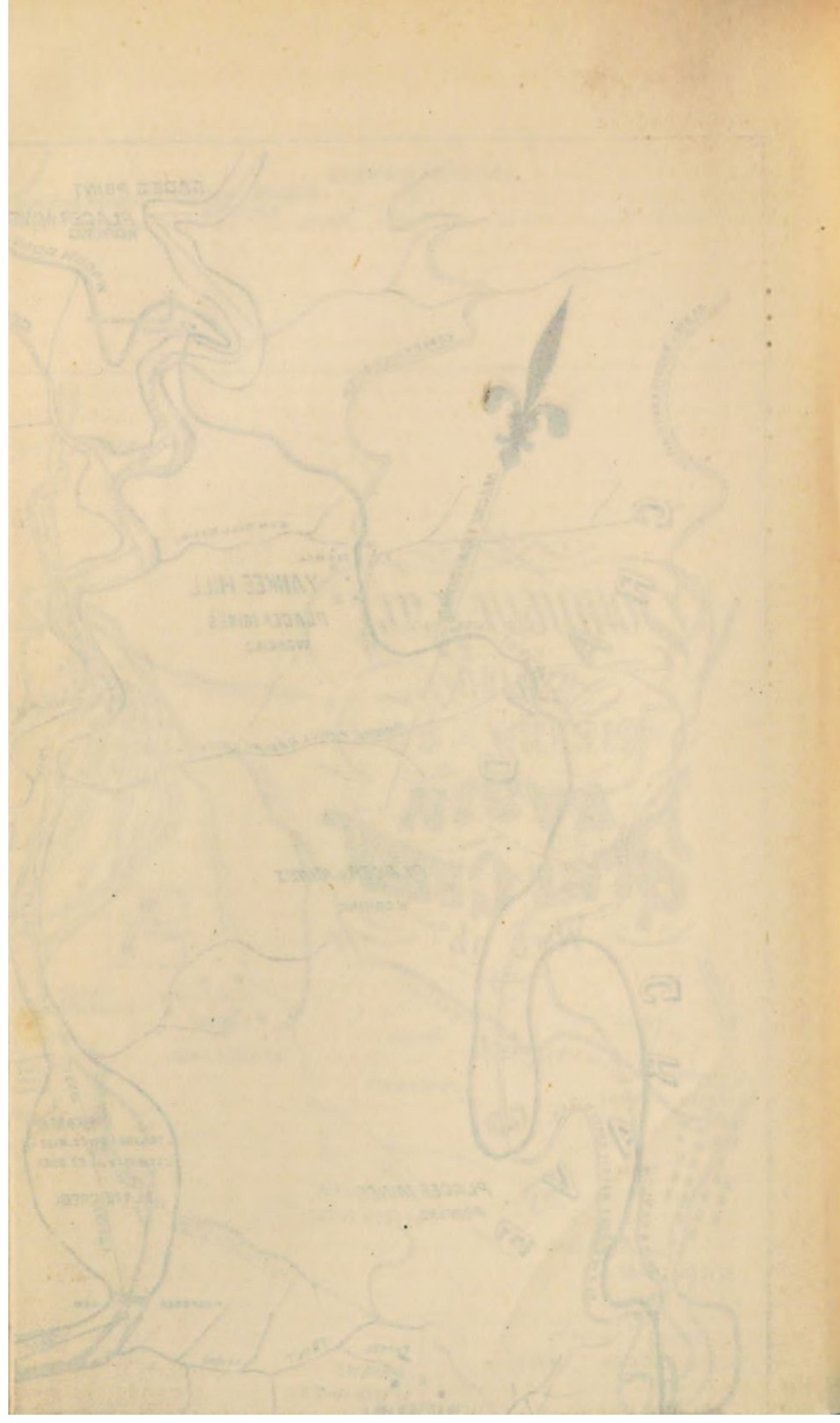
The utility of the falls is not apparent at the first glance, but when the vast amount of iron and other metallic forms of cement, found so extensively all through the mines in this vicinity, is taken into consideration, the necessity for them will be perceived. Some of the cements, after having rolled through sluice-boxes for a long distance, and after attrition with sharp rocks, and being ground by contact therewith, still retain the gold with the same tenacity as if it were imbedded in a solid quartz-rock. Tumbling over the falls with a heavy body of water falling on it, has a tendency to crush or break up the cement, and to release the gold. The supply of gravel reaching these ravines is now as great as it ever was, and, with the new developments making in the surrounding hills, it may reasonably be expected to continue for a long period. So long as the placers are productive, so long will these ravines and creeks continue to accumulate the auriferous *débris* of the hydraulic and drift banks above them.

Slate Creek.—This has been for over twenty-two years a reservoir for the deposit of *all the tailings* washed from the hills around. It is also a large natural flume, through which the rich, gold-bearing earth from thousands of acres has passed; and it is so situated that it will be fed for hundreds of years to come by the tailings from rich hill-diggings. These creek-diggings have facilities for drainage that are often wanting in other localities of similar character, and which may be artificially still further improved. They have also sufficient free water to work all the time, both for milling and mining purposes. For miles along the stream the tailings-deposits are scores of feet in depth, and from 150 to 800 feet in width, with the exception of one point at the falls below Rabbit Creek. They reach over twenty miles to the Yuba River, being the most extensive in the State; and a large proportion of them came from diggings of exceeding richness.

To give an idea of the value of the sulphurets and black sands of these mines, which have been heretofore considered worthless, it may be mentioned that Mr. Cox, superintendent of the Sears Union Water and Mining Company, at Chandlerville and Pine Grove, ordered this year a portion of the sulphurets and sands to be saved out of a piece of ground he was working. They saved fifty-one candle-boxes full, (the boxes of uniform size, 12 inches long, 9 inches wide, and 6 inches







deep,) and had them hauled to a little arrastra, when, to his surprise, they yielded \$736. From observations made by Mr. Gowell, an intelligent mine-owner at La Porte, it is estimated that, in early days, when mining was done in sluices with heavy grades, the loss of quicksilver was from 50 to 65 per cent. Since then, using less grade, the loss has been about 33 per cent. of quicksilver. This quicksilver is scattered on the surface of the ground to be washed. The original formation of gold-bearing gravel in this creek, about 1 to 10 feet deep, also proved very rich in coarse gold.

In the spring of 1853 the miners commenced pouring in the secondary deposits from their hydraulic operations above, since which time no work has been done in the original formation, nor in the secondary deposits of the creek. The artificial deposits came so fast, and spread so wide, that there was not sufficient grade to work them. The ownership of over five and one-third miles of this valuable tailing-creek has become, in the course of time, consolidated in the hands of two companies.

From below Pine Grove, where Slate Creek becomes very flat, down to Saint Louis Bridge, a distance of two miles and 800 feet, the Eureka Tunnel and Mining Company is the sole owner. It has made a tunnel, through a point under the Saint Louis and La Porte wagon-road grade, 269 feet long, 11 feet wide, and 7 feet high. By this some 15 feet in depth was gained—not enough to work the tailings too near the bed-rock. It contains two flumes, one 5 feet wide and the other $3\frac{3}{4}$ feet. The improvements cost about \$18,500. But not having sufficient fall for discharge below the tunnel, the tailings “backed up” upon this claim from Portwine Bridge, where the falls commence, and continue down the cañon. This company will have to wait until the lower company shall sluice out these backed-up tailings by utilizing the fall at the lower end.

Below this the Alturas Gold-Mining Company is sole possessor of three miles and 1,022 feet of the creek, its claim reaching over 1,000 feet below Portwine Bridge, and including the falls and the only outlet of the tailings of both the gravel-channels of this Grand Slate Creek Basin. At Portwine Bridge this company “brought up” some falls in the creek below, and ran a tunnel 12 feet wide and 16 feet high, thereby gaining considerable grade, but still not enough, while, with an outlay of little more capital, it could obtain all necessary fall for all the tailings of the whole creek and all mines above. This company has taken out of ground, which it was able to work by virtue of its permanent improvements, over \$40,000. The lower end of this ground, having a good fall, has been worked almost yearly for the last fifteen or twenty years, Chinese having paid \$1,000 rent per year for the lower 1,000 feet. Last year the company rented to a Chinese company, for \$5,060, a piece of ground most of which had been once worked.

Failures in working tailing-mines are very unusual, and, when they do occur, are always attributable either to the cost of water, which is the chief item of expenditure, or, more frequently, to mismanagement. There is scarcely an instance known where large profits have not been made, when, as in this locality, the water-property and the mines have been in the same hands.

Work on these claims has not been vigorously prosecuted, on account of disagreements among the partners.

In working a creek like this one, a face of work of a proper width in the creek should be brought up at a regular grade, and retained by removing the big boulders and projecting bed-rock points in the natural channel of the creek, and by blasting from the falls a bed-rock cut or

flume, confining the tailings to a limited channel, and thereby gaining more velocity in their flow. Operations should be so conducted as to leave a solidly built-up channel, say 100 feet wide between the walls, with a bed-rock cut or flume of 6 to 12 feet wide. The former gives ample room for freshets, and the small cut is of proper width to carry all the tailings away during the low stage of water in the dry season. It should have an even grade, and be as straight as practicable. These preliminaries secured, the banks may be worked out. At the same time a strong dam, several miles above the lower end of the mine, should be built from the bed-rock, instead of the top of the tailings, as has been the usage of this company heretofore, a practice always involving heavy repairs, since it is hard to make a dam stand built on the top of the ever-shifting tailings. The object of this dam is to control the flow of the tailings at pleasure.

The channel left open as advanced would be a tailing-flume, not liable to expenses like a wooden flume. In fact the continual flow of tailings at and near the bed-rock in a confined bed would, to some extent, deepen the cut. Once a year, or once in two years, this cut could very easily be cleaned up by shoveling the residue into sluices. The cost of such an enterprise would be small in the event of the creek-bed being properly worked out. It would require only the opening and walling up of the channel for the waters and tailings to run in, and it would pay for itself after the first few hundred feet would have been completed, since these could be cleaned up year by year in sections, or rented to the Chinese. In working past the mouth of any ravine, bringing water and tailings from the hills, a side feeder to the main cut or bed-rock flume should be left open, and its sides walled up, to conduct the water and tailings into the main stream. Thus, year by year, a system of works would be extended, that would yield large returns on cleaning up at the low-water stage.

This system would be greatly aided by building the dam above alluded to, enabling the company to control the amount of tailings to be admitted to the bed-rock flume, or artificial channel, by gates built in it, according to the volume and force of the water at any period of the year, with the exception of the great floods, when they should all be opened.

From such a dam, ditches could be dug down the sides of the creek for hydraulic washing of its tailings and banks into the main flume through sluices, saving most of the gold in the latter, and also furnishing power to saw-mills, derricks, and grinding-apparatus for sulphurets, black sand, and cement.

It is reported by Dr. Brewster, of La Porte, who has been for the last eighteen years engaged in the transportation of the United States mails between La Porte, in Plumas County, and Marysville, in Yuba County, and also in the transportation of gold-dust and bullion for the different banking and express companies, that from account-books in his possession, he finds that there has been transported for the banking-house of John Conly & Co. over \$40,000,000 of gold-dust and bullion, valuing the dust at \$20,000 for the 100 pounds, or 100 tons of treasure for that house alone. The banking-houses of Evarts, Wilson & Co., Eve & Crew, Wells, Fargo & Co.'s Express, and the Union Express Company have shipped at least \$20,000,000; and he says it is a safe estimate that one-fourth the product of this mining-region has passed over the road in private hands, of which, of course, no account is kept. Nine-tenths of this aggregate have been taken from the above described Slate Creek Basin.

Iron-fields.—In the northern part of Sierra County, on the headwaters of the North and Middle Forks of the North Yuba River, about twelve miles northeast from Downieville, the county-seat, the Sierra Buttes, near Gold Valley, at an elevation of about 6,000 feet above sea-level, contain very valuable deposits of different kinds of iron-ore, which are in extent and position in the highest degree available for easy working. The Sierra Iron Company of San Francisco, under the management of Mr. W. S. Day, is about to apply for a United States patent to their valuable mine.

The course of the iron-deposits is from northwest to southeast, and is inclosed by syenite on the northeast, and a limestone belt on the southwest. According to Baron von Righthofer, who examined these mines years ago,* and reported very favorably upon the same, the ore in sight amounted to 1,400,000 tons, averaging 40 per cent. of iron, of which 300,000 tons are in one cropping alone, and 50,000 tons in another, which can be obtained by simple quarrying. The deposit is of good quality, and remarkably pure. It occurs in three different conditions:

1. Massive, nearly pure magnetic-iron ore, fine-grained, having the appearance of steel, containing 60 to 75 per cent., not only attracting the magnetic needle, but also capable of magnetizing steel.

2. A mixture of pure magnetic-iron ore with carbonate of lime, considered as rich as the ore of the first class.

3. Chlorite and talcose slate, containing innumerable crystals of magnetic iron, in regular octahedrons, forming as pretty cabinet specimens as can be desired, and yielding about 50 per cent.

The necessary flux required for smelting is mixed with the ore itself, or found in the vicinity, and an unlimited, cheap supply of charcoal may be had from the extensive surrounding forests.

Quartz-mines.—The principal quartz-mines of this county have been mentioned in former reports; and lack of space compels me to omit a discussion of their recent history. I am convinced that the comparatively large space devoted to the placer and gravel mines of Sierra has been well bestowed, since these important and enormously productive industries have not received in former reports their proper share of attention.

PLUMAS AND LASSEN COUNTIES.

These two counties, situated in the high Sierra, possess much undeveloped mineral wealth. The sources of the ancient rivers were probably in these counties, not far from the volcanic peaks west of the main range of the Sierra; thence their general winding course was southerly, for a distance of two hundred miles or more, to the edge of the San Joaquin Valley, fed by many tributaries from both east and west.

Plumas County is approachable by three routes, all crossing high mountainous ranges: one by way of the Northern Pacific Railroad, via Oroville, by Oroville and Greenville stage line; another via Marysville and La Porte, and the third by Central Pacific Railroad via Truckee, Jamison City, and Sierra Valley. This route is preferable in the winter-season, as the approach is by a series of valleys below the snow-line.

This county has an area of 4,200 square miles, and its topography embraces the rugged grandeur of the Sierras, combined with a number of beautiful and productive valleys, not inferior to Sonoma, Berryessa, and other of the noted valleys of the Coast Range, either in attractive scenery or the richness of the soil. The main ranges rise to an alti-

* See my report of March, 1870, p. 59.

tude above sea-level of from 6,000 to 7,000 feet, while many peaks rear their snow-clad, lava-capped tops to a height of from 8,000 to 10,000 feet. Among the most noted of these are Lassen Butte, Pilot Peak, Alturas, and Spanish Peaks. Among these mountains rise the various branches of Feather River, (the Rio Plumas of the Spaniards,) irrigating the valleys, and furnishing the miner with unfailing streams of water during nine months of the year.

The principal valleys are American Valley, Meadow Valley, Indian Valley, Sierra Valley, Mohawk Valley, Butte Valley, Grizzly Valley, and Red Clover Valley. Some of these valleys embrace about one hundred square miles of the finest land in the State, capable of producing in profusion all the cereals as well as fruit and the grape. Wheat at 50 bushels to the acre is not uncommon, and the size and flavor of the fruit are unsurpassed. The altitude of these valleys rarely exceeds 4,000 feet above sea-level; Quincy, in American Valley, having an elevation of 3,700 feet. Here the snow rarely falls over 12 inches in depth, and remains but a short time on the ground, while on the surrounding ranges it falls from 12 to 18 feet, and continues a great portion of the year, to the great benefit of the miner and agriculturist. The climate of the valleys is genial, neither excessive heat nor cold being known. The country is essentially self-sustaining, and raises all the wheat and vegetables consumed, with a capacity of sustaining a population of 40,000 or 50,000. At present the population does not exceed 5,000 souls, a majority of whom are engaged in mining, but (except in quartz at some localities) on a small and insignificant scale compared with the resources of the country.

The agricultural capacities of the country are sufficient to support a large population, but as export is impracticable until a railroad shall be built through Beckworth Pass, it is not probable that farming will be carried on extensively for many years. The mineral-resources of the country are, however, unsurpassed, and deserve the attention of capitalists and mining-operators. The mountain-ranges are cut by large and continued ledges of quartz, frequently of immense width and promising appearance. Only two districts have so far been opened on an extensive scale—Indian Valley and Eureka districts. In the last-named district is the celebrated Plumas Eureka mine, recently purchased by a London company for \$1,000,000. The quartz-veins of the county have not been prospected, or even located, and the traveler is surprised at times to find the "color" in ledges cut by the grading of the roads—ledges which are unlocated, unprospected, and undeveloped.

Of the extent of the placer, hydraulic, and gravel mining-ground in this county but little is known. Exploration, so far, has only demonstrated the richness of this class of ground, but its area seemingly is unlimited. At some remote era, prior to the volcanic period, the disintegrating action of torrents of water, of such volume as to be unappreciable at the present day, has covered the then rivers, valleys, and level-lands with an immense deposit of the comminuted particles and fragments which form the sedimentary gold-bearing deposits of the California gravel-ranges and ancient river-beds. The theory of "ancient channels" can, however, scarcely be reconciled with the wide spread and almost universal sweep of debital matter which has covered this portion of the State. That such channels or beds of former years do exist in counties farther south is undoubted, but in this portion of the State either the whole of the then surface was covered, or numerous streams existed flowing from north to south, and uniting further south in one or two great rivers carrying more water than the combined wa-

ter-system of the present day. This question can only be solved by the labors of the Geological Survey.

The extensive auriferous deposits of Slate Creek Basin, on the line of Sierra and Plumas Counties, have been described in detail under the head of Sierra County.

The rivers, creeks, and bars of the modern streams were extensively worked at an early day, with an astonishing result in the production of gold; but they were abandoned during the Frazer River excitement, and the subsequent discovery of silver in Nevada has drawn off most of the mining population. These shallow placers are not, however, wholly worked out, and good wages may yet be made in this class of diggings. Many of the small creeks have not been worked, and locations are shown, opened the present year, where from \$5 to \$10 per day is made in placer-mining, with no other appliance than the sluice-box. The gravel and hydraulic ground has only been worked in spots, and on a small scale, (except at La Porte, which is more generally identified with Sierra County, and was incorporated in Plumas County a few years since.) The Maxwell Mining and Ditch Company, on Spanish Creek, has commenced a mining enterprise which bids fair to be profitable. The company has claimed the water of Spanish Creek, and the ditch leaves the river at the falls, about a mile above the mouth of Blackhawk. The ditch can carry about 4,000 inches, and for a good portion of the season the water privilege is sufficient to keep it full. The company intends to work first at Brown's Point, just below the Spanish Creek bridge. Good prospects have been obtained at this place and it is thought that a large amount of paying ground will be found here. The ditch will be extended down the river as fast as possible, as it is known that several high bars under the line of the survey will pay well for working. It is not improbable that diamonds may be found in this region, and will some day be systematically sought for. One veritable crude stone weighing one karat has been found in Slate Creek, just over the county line, and is now in the possession of a gentleman in La Porte.

Quartz-mining.—The principal quartz-mining of the county is in the vicinity of Jamieson City and Indian Valley. Near the first-named locality is situated the celebrated Plumas Eureka mine, now owned in London. From a report of Mr. J. S. Phillips, of San Francisco, made at the request of the former proprietors, immediately prior to the transfer to the English owners, the following description of this valuable property is extracted and condensed:

The Plumas Eureka mine lies within six miles of the general axis of the Sierra Nevada, but in a region where the range is traversed by the sinuous valley called Beckworth's Pass, at an elevation of 4,800 feet above the sea, leaving several isolated, syenitic peaks, around which are the tilted secondary strata of talcose slate, carbonates of lime, magnesia, &c. Dikes of fine grained felspathic mixtures and greenstones also occur.

This property comprises the Eureka, the Seventy-six, and the Rough and Ready veins, cropping on the precipitous eastern declivity of Eureka Peak, one of the isolated elevations above mentioned. The veins are in the stratified formations flanking the syenitic core. Other veins, said to occur in the primitive rock, have not been sufficiently explored to prove their value. Much work has been done on the Eureka vein, and its general character has been well exposed. It is a strong lode, varying in course from S. 20° W. to S. 36° W.; and in dip from 46° S. to 60° W. Its width varies also, as the result of these irregularities and of movement of the walls. Mr. Phillips mentions the latter as distinct and generally "unctuous," and refers to a peculiarly well-marked corrugated face of quartz, seen in all the workings, from 2 to 3 feet in the vein from the foot-wall, and dipping about 45° mountainward, which he thinks indicates that the sides have slid extensively on each other. The foot-wall, he says, is a very congenial syenitic greenstone, and the hanging-wall, at times a superlatively generous talcose slate, at others a blue carbonate of lime, or yellow mixture of lime

and magnesia, which also form frequent splices and horses in the vein, near the best paying quartz.*

The lode in the most advanced workings is 24 feet wide and well defined; the quartz is here stained with the oxide of iron and speckled with sulphurets of iron and lead. As a general rule the vein has carried disseminated gold pretty equally. Large pieces have been rare. For some distance behind the breast just mentioned the formation is disturbed by "horses;" and though the branches contain considerable reserves of paying quartz, these are far from equal to the outside deposit, from which at least \$2,000,000 has been already produced.

Seven levels have been driven on the Eureka vein. The railroad or engine tunnel, through which the mine is now worked, has been driven nearly 1,000 feet into the mountain, attaining a vertical depth below the surface of nearly 400 feet. At its inner end the breast of quartz already alluded to of 24 feet in width has been discovered. Above this, the Rhoda tunnel has been driven 480 feet, and communication obtained by a winze sunk on the vein from level to level, affording excellent ventilation, and opening a back of 170 feet of paying lode, from 2 feet to 5 feet wide. In this part, between the large outside deposit and the interesting new discovery in the railway tunnel, stoping has lately been carried on. Again, 140 feet above the Rhoda tunnel, the upper tunnel has been driven some 210 feet. Both of these fall considerably short of the region of the new discovery below them. About 150 feet from the entrance to the railway tunnel, and 600 feet behind these stopes, a shaft has been sunk 243 feet and four levels have been driven, one called Harper's, being 55 feet deep, 730 feet long, and containing seams of \$10 rock.

The value of the quartz from the 24-foot breast is estimated from five average assays at \$22 per ton; the 4-foot vein, in upper works, yielded \$20 to \$21.60; the outside deposits along the outcrop, \$35.28, \$12.80, and \$8.60; concentrated sulphurets from all parts of the lode, \$4.86 per ton.

Little has been expended on common roads, but a tram-road has been constructed to convey the quartz from the railway to the mills, which lie about three-quarters of a mile distant, by a descending track around the artificial lake. This lake has been created by damming back, at great expense, the water from the dissolved snow during the spring and summer months, into a natural hollow of sufficient size to supply two mills, of 16 and 12 stamps respectively, and a Chilian mill. These are driven by separate water-wheels, and the long ravine would permit the erection of other mills to be worked in succession by the same water. A small roasting and chloridizing apparatus has been erected for the treatment of the sulphurets, which have, however, not been thus far beneficiated, but await the coming summer. Dwelling and boarding houses, offices, and workshops have been erected near the mill and at the mine, and a moderately good running supply of materials is kept in stock. These have cost little short of \$300,000.

Indian Valley.—The mining interests of Indian Valley have suffered during the past year from one of those periodical depressions to which this branch of business is subject. Two or three hundred men have dwindled to one-quarter that number. Three of the principal mines, the Crescent, the Indian Valley, and the Kettle, have changed hands, and the former have not yet recommenced operations. Of the other mines, the Union and Bachelor's have been running long tunnels to strike their ledges at a considerable depth.

The main lode or fissure of this district runs northwest and southeast, incased in granite, and averaging 15 feet in width, with very distinct walls. It has been located for a distance of five or six miles. Commencing at the eastern end, the Crescent is the first. In this part of the ledge the walls are broken up and the quartz forms a distinct breccia; the gold is very coarse, and in the upper levels the quartz paid well; latterly, however, the yield has decreased. This mine, if ever again worked, will require a large amount of capital to put it in shape, most of the upper works having caved in through neglect of the timbers, and all the pay-rock below, as far as the shaft is sunk, (about 400 feet,) being mostly worked out. Following the course of the fissure westward, the next mine is the Bon Accord. This has great natural facilities for working, of which the former owner, Mr. C. Cahalan, took advantage in pros-

* As I cannot fully comprehend, I am unable either to accept or reject the nomenclature, and what might be called the *geognosis*, of this description.—R. W. R.

pecting the claim, having run five tunnels in on the ledge from 75 to 120 feet below one another, thus opening out a large supply of rock, and obviating the necessity of hoisting or pumping gear for years to come. The vein here courses about 60° north of west, and dips almost vertical. It shows in the lowest level a width of 16 feet, but, so far as tested, the rock does not yield over \$5 or \$6 per ton. There has never been a mill on the ground; the mine has been sold by the sheriff, and since then nothing has been done.

The next mine on the lode is the Pennsylvania, likewise idle at present; formerly it paid well, and the owners had a 12-stamp steam-mill, but the property was sold by the sheriff.

The next is the best mine on this lode, both in development and in steady paying quartz, namely, the Indian Valley mine. The lode courses about north 65° west, and is 26 feet wide at the bottom of the 650-foot shaft. This shaft was used for pumping and hoisting, but was partly caved in September, 1871, in consequence of the hoisting-works burning down, since which time the mine has been worked through a tunnel, cutting the ledge at a depth of about 300 feet at the east end of the claim. The ore now extracted pays on an average \$12 per ton; but the ore from the pay-chimney at the southwest end is of a much higher grade.

Joining the line of the Indian Valley is the Union mine, which has paid well in the upper works, the rock averaging \$25 per ton. During the past year the company has run a tunnel over a thousand feet to strike the pay-rock in depth. In the mean time a convenient and complete steam-mill, with 24 heavy stamps, has been erected at the mouth of the tunnel, thus obviating the hitherto expensive hauling. This mine ends the series of workings on the main lode of the district.

On the south side of this main-fissure are a series of smaller ledges that have been worked at different times with varied results. The most important of these are the Green Mountain (Bachelor's) and the Kettle. They are likewise in granite, the former about 4 feet in width; the latter, 3 feet. The Green Mountain averaged for a long time \$50 per ton. At present the mill is not running, the owner, Mr. Bachelor, being engaged in running a deep adit. The Kettle mine has not been in operation since its transfer to the present owners in England. The whole of this district is supplied with wood and water. The price of wood is \$3 a cord, delivered; lumber, \$20 per M.; wages, \$2 a day and board.

The Haydon Hill mines, in Lassen County, California.—These mines were accidentally discovered in the fall of 1870, and since that time numerous locations have been made. The principal are the Old Providence, the Haydon Hill Company, Haydon's mine, and the Providence. The country-rock is of sedimentary origin, greatly broken up by volcanic action, and partly metamorphose. In this the fissures are found without any apparent regularity, coursing both north and south and east and west. The gold is of very fine grain, indeed so much so that it will float on water. It is likewise strongly alloyed with silver. The veins are from 1 to 6 feet in width.

The Old Providence is the oldest location. The ledge runs east and west, is opened by a shaft 75 feet deep, and from it a short cross-cut to the vein, on which some drifting has been done. The company is at present putting up a horse-whim, with the intention of sinking 60 feet farther. It is hard to tell what the rock has averaged, no uniform method having been used in working. At one time the ore was treated in an arrastra; then the loose crevice-dirt was run through sluices; and

finally an 8-stamp steam-mill, with two pans and a settler, was erected and run for a short time last winter, with poor success. About \$40,000 has been extracted. The mine has changed hands, and is being worked systematically. The new company has started 4 stamps to prospect the mine, and so far the rock has averaged \$20 per ton. The only spring of water for some distance around issues from this ledge. The company employs at present six men at the mine and four at the mill.

The Haydon Hill Company has three tunnel-claims of 3,000 feet each on the west side of the hill. On one of these the tunnel is in 250 feet. It has not struck any pay as yet, but has run through some fine white clay.

Haydon's mine is on the north side of the mountain, and consists of two tunnels, cutting the ledge. Some of the rock out of this claim was shipped to the English mills in Reno last fall and paid at the rate of \$100 a ton in gold and silver. The owners, Messrs. Haydon and Lewis, are working alone in this claim.

The Providence Company has sunk a shaft about 75 feet on its ledge and commenced to drift. Different samples of their rock, sent to San Francisco, have given very good results. The country is pretty well supplied with timber, but the lack of sufficient water is rather a drawback.

List of quartz-mills in Indian Valley district, Plumas County, California.

Name of mill.	Location.	Owners.	No. stamps.	No. pans.	Power—steam or water.	Remarks.
Crescent	Indian Valley.	English limited liability company.	32	1	Steam.	Has not been running any time during the year, on account of transfer to present owners, who have not yet commenced operations.
Indian Valley.	do	Messrs. Applegrath & Drake.	24	2	Steam.	Has been running about seven months. It shut down in the spring to put pans in and to develop a new pay-chute, the main pay-chimney being under water at present, in consequence of the destruction of the hoisting-works by fire.
Union	do	Incorporated companies; office, San Francisco.	24	—	Steam.	Has just been completed, and expects to start up in November. The old mill, driven by steam, contained 12 stamps and 1 pan, and worked about four months in the beginning of the year.
Kettle	North Cañon..	English limited liability company.	16	1	Water.	Has run a couple of months on custom-rock; the owners have not commenced to work their mine.
Bachelor's	Dixie Cañon ..	Bachelor	4	—	Water.	

Gravel-mining.—In the summer of 1872 there was discovered, in Lassen County, twelve miles south of Susanville, on the very summit of the Sierra Nevada, an extensive body of auriferous gravel, which has since been tested and found to be of high grade. This mass occupies a sort of basin, granite on one side and volcanic tufa on the other, is five miles long and half a mile wide, and at the only point exposed, a break in the granite rim on the west, shows a vertical depth of 500 feet. What imparts additional interest to this discovery is the fact that this deposit is not only isolated in position, being many miles to the east of the main

gold-field, but that it lies at an altitude of more than 8,000 feet above the level of the sea. The gravel here, though mixed with volcanic mud and ashes, appears to be free from the more tenacious clay and hard cement, often so troublesome in that found in the old-river channels. It is quite loose, and can therefore be easily disposed of with water, of which there is plenty at hand, there being three small lakes in the ground, besides great quantities when the snow melts in the spring. The gold is coarse-grained, but of fair quality, worth \$18 per ounce, and in all respects identical with that found on the upper waters of Feather River.

The parties locating this basin of gravel have procured surveys to be made with a view to obtaining a United States patent therefor. They have also made preparations to work it by hydraulic washing in the spring of 1873.

THE NORTHERN COUNTIES.

The mining-region of the northern part of the State covers great portions of the counties of Shasta, Siskiyou, Trinity, and Del Norte. Within these limits are embraced large areas of auriferous ground in placers and lodes of gold-bearing quartz and of cinnabar. The placers have been profitably worked, on a comparatively small scale, for more than twenty years by a sparse population; and the mining-industry is in a backward state, both laborers and capitalists having been repelled by the remoteness of the region from the ordinary channels of travel. With the near approach of the Oregon and California Railroad, this condition of things seems likely to change. All classes are beginning to turn their attention in that direction, and many new and important mining-enterprises have lately been inaugurated.

Dr. Henry De Groot, of San Francisco, has recently visited this portion of the State, and furnishes the following account of his observations:

The mines here, though similar to those in the main mineral-range, which occupies the foot-hills and westerly slopes of the Sierra Nevada, have not been so extensively worked as the latter. Only the surface-earth has been washed, while little has been done at hydraulic, deep-placer, or vein mining, this class of deposits being still almost in a virgin state. Here remain immense bars, forming high benches along the rivers. These have been but little disturbed by the miner, it being difficult to get the dirt down to the water and expensive to construct ditches for bringing water on the bars. These benches were formed from material deposited by the adjacent rivers at a time when they ran in much more elevated beds than at present. Many of them are not only high—from 100 to 300 feet—but cover a large area, often a hundred acres or more. Having been deposited by the action of water alone, and without any intermixture of volcanic matter, the gravel here is loose, and free from cement, pipe-clay, and large bowlders. It can therefore be broken down and washed readily with a moderate head of water, and without the use of powder. The dirt uniformly pays well; moderately on top, and steadily increasing to the bed-rock, where, as usual, it is richer. The gravel throughout will average half a cent to the pan; more than double that in the large hydraulic claims at Cherokee Flat and Smartsville. Water in these northern mines is very abundant, and can be brought on the most of these bars at a moderate cost. In some cases water from mountain-streams can be conducted on these bars without being carried a great distance. In others it can, in like manner, be taken from the main river, the descent of which is generally such that a sufficient head for hydraulic washing can be obtained, with only a few miles of ditching. The conditions for hydraulic operations are therefore generally favorable.

There also occur, at numerous points in this part of the State, auriferous deposits in old-river beds, not, perhaps, the channels of pliocene streams, as along the slopes of the Sierras, but those of the present day, the waters of which, dammed up by land-slides or the material brought down by some great flood, have been forced to find a new passage to the sea, the old one having afterward been filled up by the deposits made at high water and the wash from the neighboring hills.

At some points on the Klamath River this filling up and shifting of the stream appears to have been comparatively recent. At Klamath Bluffs, thirty miles from its mouth, the river, obstructed by an immense land-slide, has been compelled to make for itself another passage a quarter of a mile farther south, through which it now runs, a high ridge of bed-rock separating the two channels, the old one being now occupied by a rich and extensive bar, upon which large mining-operations are about to be commenced by a San Francisco company.

Both north and south of this locality, sometimes at points nearer the sea, and sometimes farther inland, fragments of these old-river bars and obstructed channels are met with under the names of "gold-beaches," given under the impression that they indicated the site of ancient shore-lines, and had been thrown up by the ocean surf. But the manner in which the larger rivers of that section are observed to have been diverted from their beds and the latter afterwards filled up, forming deposits exactly like these, seems to argue for both a similar origin. That they have all been formed at periods more or less remote, some of them in the distant past, is evident from the magnitude of many of these deposits, the mass of which could have been gathered only by slow accumulation, and from the deep alluvial soil, often growing stately forests, that covers most of them.

The formation of the "gold-bluffs" found on the sea-shore in the neighborhood of these "beaches" is due, no doubt, to a like cause, their greater elevation being explained by the fact that the level of the river-beds was much higher formerly than at present. The principal, and what is known as the original "Gold Bluff," lies twelve miles south from the present mouth of the Klamath River. At a point fifteen miles up that stream a deep depression sets in, and running in a westerly course (the present river bearing northwest) terminates in Gold Bluff, abutting on the sea, and here several hundred feet high. Through this depression, the bottom of which is much higher than the present river-bed, the Klamath once ran; the channel having afterward been filled up and its banks obliterated by the gravel and sediment brought down the stream at high water and washed from the slopes of the steep and lofty mountains adjacent; and we have only to suppose the latter process continued for a great number of years to produce here another of those subterranean gold-bearing channels met with elsewhere in this section of country.

As is well known, auriferous beaches occur at intervals along the sea-shore from Humboldt Bay for a distance of more than two hundred miles to the north. These have been formed in part from the gold brought down by the several large streams that disembogue along this section of the coast, and in part by the washing away of the gold bluffs also met with here, which perhaps at one time extended much farther into the sea than at present, the accident of the gold being deposited at these particular localities being due to the ocean eddies and currents that prevail in the neighborhood.

The manner in which the outlet of these rivers might have been filled up is shown by the state of things existing now at the mouth of the Klamath. This river and its tributaries run through an exceedingly mountainous country, usually subject to heavy rains in the winter. During very wet seasons, like the past, the water, confined to a narrow channel, rises to a great height, bringing down vast quantities of sand, gravel, and drift-wood, swept into it from its steep and heavily-timbered banks. Having reached the mouth of the river this material is there deposited, forming sand banks and bars that sometimes extend so nearly across it as to leave only a very narrow open passage for the water, most of which makes its way at low stages through these beds of sand and gravel. To such an extent had these been accumulated at this point by the floods of the preceding winter that in the fall of 1872 a person could almost walk across the Klamath, though it carried a volume of water equal to the Sacramento above its junction with Feather River.

Besides the various forms of placer-mines above described this region contains vein-deposits of great extent and variety, the more important consisting of gold, cinnabar, and copper; all of which exist under favorable conditions for cheap development, the country being full of fine streams, affording a vast amount of water-power, and abounding everywhere in magnificent forests of pine, cedar, and spruce. Many of the gold-bearing quartz-lodes have been more or less tested, a few quite extensively worked, and generally with good results or encouraging prospects.

The copper veins, some of which have been opened to a depth of 300 feet, show promising indications of permanent wealth. Of this class of lodes the most extensively developed are situated at Low Divide, eighteen miles north of Crescent City, from which several hundred tons of ore have been extracted and shipped to San Francisco. It is of the gray variety and assays from 18 to 20 per cent. of metal.

At Trinity Center, Trinity County, what seems a valuable deposit of cinnabar has lately been discovered, the ore here occurring in veins and distributed in small fragments throughout the soil and along the gulches, where it has been carried by the action of water, exhibiting the rare example of quicksilver placers. This cinnabar-bearing tract, which lies on a high ridge between two forks of Trinity River, is about

one mile long and a quarter of a mile wide, the formation being a sandstone covered with a clayey soil. Through it run in every direction innumerable small but exceedingly rich veins of this ore, to the disintegration of which is due the enrichment of the gulches and surface-soil adjacent. Scarcely a pan of the latter taken at random fails to show a little and frequently a large "prospect" of cinnabar, while the gulch dirt will yield from one to two pounds of 60 or 70 per cent. ore to the pan. It is the intention of the owners of this property to wash the top earth in sluices. In the meantime the net-work of small veins will be explored in the hope that they can be traced to a main central lode, believed to exist in the neighborhood.

TRINITY COUNTY.

Mr. B. C. Wattles, of Weaverville, Trinity County, writes as follows concerning the progress of mining in that vicinity :

Our mining operations are principally hydraulic. About forty claims are being worked, the most noted of which are the Bolt's Hill, the Holmes, and the Red Hill. The depth of ground varies from 60 to 100 feet, and the average yield of the dirt is probably higher than elsewhere in the State. The product of the county for the past year has been estimated at \$1,000,000. It is impossible to estimate with any degree of accuracy the quantity or proportion of ground worked out. In some claims from 75,000 to 100,000 square feet of bed-rock has been stripped; while in others but a small extent has been exposed. We have in this county a range of gravel extending from Trinity Center to the North Fork of Trinity River. This range is about fifty miles in length, with an average width of over five miles, and a probable average depth of 60 feet. The only point at which mining has been prosecuted with vigor has been at Weaver; there has so far been a lack of water elsewhere. Recently a company has been formed and operations commenced to bring water on this range from Stewart's Fork, and another for bringing water from the North Fork to the Holmes and Red Hill ground. The latter ditch will have a capacity of 10,000 inches. The great drawback to the success of our hydraulic mines has been this want of water; and with the construction of these ditches a new era of prosperity will dawn for Trinity County.

SHASTA COUNTY.

The Dry Creek Tunnel and Fluming Company, in Shasta County, own about 1,600 acres of mining-ground near Horsetown, extending for a distance of three miles along the bed of Dry Creek, and averaging half a mile in width. A considerable portion of the surface of their ground has been mined at different times, with fair results, by the old-fashioned methods; but on account of water and lack of fall for tailings no work of any moment was done on the dam until the fall of 1870, when the company now in possession commenced operations for the purpose of opening the mine in such a manner that it might be worked on a large scale, and all the modern improvements in hydraulic mining applied to its development. In order to accomplish this the company found it necessary to excavate an open cut 1,200 feet and a tunnel 2,400 feet in length from Clear Creek, a stream running parallel to Dry Creek, but several hundred feet below the level of the latter, for the purpose of gaining access to their ground at a sufficient depth, and also of obtaining a convenient tail-race through which to carry on their washings. This tunnel runs upon a grade of three feet to every hundred, through a gravelly ridge, and terminates near the center of the company's claim in a bed of auriferous blue gravel, at a depth of 100 feet from the surface. Water for hydraulicking is obtained partly from a ditch carried along the adjoining ridge and partly by utilizing the waters of Dry Creek. The improvements already made upon this mine have occupied two years' time and been effected at a cost of nearly \$50,000. The preparatory work upon the mine is all completed, and actual mining is just commencing.

The Piety Hill Blue-Gravel Company's claim consists of a bed of auriferous gravel about 300 acres in extent, and averaging 50 feet in depth.

An excellent tail-race has been obtained by a deep cutting, 1,500 feet in length, from Clear Creek to the center of the claim, excavated through hard rim-rock at an expense of over \$2,500. The ditches supplying the company with water are twenty-three miles in length, and afford 800 inches of water during eight months in the year. There is no non-paying top-dirt in this claim to contend with. The deposit is extensive and yields more or less gold from surface to bed-rock. A washing of 2,000 cubic yards from a bank 30 feet in height in June, 1872, yielded \$741.26, or an average of 37 cents per cubic yard. The present company have been in possession since December, 1871, and by means of a liberal outlay in money and labor have everything ready for vigorous work during the coming season. Two "Little Giant" hydraulic machines are used by the company, water being supplied to them through 1,100 feet of 15-inch iron pipe, under a pressure-head of 100 feet.

The Chicago mill and mine are situated in a granite range about two miles north of Piety Hill. The ledge is silver-bearing, and of an average thickness of 2 feet. The rock carries, besides the precious metals, considerable lead and zinc, and requires roasting. While the amount of prospecting work done on the vein is small, the rock is remarkably rich, paying from \$300 to \$500 per ton. Mr. Butterfield, the owner, has had to contend against want of capital and many other difficulties, and as yet has only a 5-stamp mill and small furnace at work, but he is gradually emerging from his troubles. In this vicinity many fine-looking ledges crop out, and on several shafts have been sunk to a depth of 80 feet or more. The base character of the ore extracted renders it impossible to treat it by ordinary mill process, and as yet no proper works have been erected to thoroughly test the veins.

KLAMATH COUNTY.

This is a rugged, mountainous region,* heavily timbered, extending from the coast easterly to within thirty miles of the base of Mount Shasta. Without attracting much outside attention, it has been a very lucrative field for gold-mining operations of a diversified nature. It commences at the famous Gold Bluffs, and extends up the Klamath and Salmon Rivers, with their large extent of river and bar diggings, to the head-waters of the latter, where, contiguous to the sources of the Scott and Trinity Rivers, both noted for their large yield of gold, are situated the Klamath and Black Bear quartz-mines, the latter ranking with the best mines in the State, and the former a very promising property in process of development.

The Klamath River traverses the country from the boundary of Del Norte County to the coast, and furnishes river and bar diggings for the whole distance. Early Indian disturbances and general isolation have combined to retard their development; but within the past two or three years, as all danger from the former source has disappeared, considerable attention is being attracted to the many large bars and hill-sides of auriferous gravel to be found at intervals, all the way from the mouth of the Klamath, through Klamath, Del Norte, and Siskiyou Counties, a distance of about two hundred miles.

Orleans Bar, on the Klamath River, the county-seat, has been the field of extensive mining-operations; and as the waters of Camp Creek are to be brought in by a ditch, now in progress, a large area of valuable ground will be made productive.

* The description of this county is furnished through the courtesy of J. F. Nesmith, esq., of San Francisco.—R. W. R.

The Salmon River empties into the Klamath eight miles above Orleans Bar, and has supported a large mining-population since 1850; but, as in other mining-localities throughout the State, the most accessible points have been exhausted, and the fruits spent in the usual style of miners, without leaving capital to open up the equally valuable but more expensive diggings that still remain on the main stream and the North and South Forks, for a distance of about fifty miles.

The North Fork, with all the streams emptying into it in the neighborhood of Sawyer's Bar, has especially been a profitable field for mining, having produced its millions. It is in this vicinity that, in 1860, quartz was first discovered on the head-waters of Eddy's Gulch, and a mill of 8 stamps erected on what was called the Live Yankee mine, which was worked, with varying success, for three years, paying dividends to its first owners. Subsequently, becoming involved from bad management and want of proper development, the property declined, and has now passed into the hands of a single individual. It bids fair to become again a valuable mine.

About a mile to the southward, in the same belt of slates, which seem to extend east and west, parallel to the North Salmon, the Klamath mine is situated on a large, well-defined vein, varying in width from 3 to 7 feet, and sometimes attaining the great width of 20 feet. Its direction is northeast and southwest, and its dip 20° E.; it carries free gold and sulphurets throughout an extent of 3,000 feet of croppings, a portion only of which has been opened and worked in depth. With a 12-stamp mill the yield has for the past two and a half years been a trifle over \$10 per ton. No sulphurets have been reduced, though the rock carries about 2 per cent. of a fine character that assay about \$100 per ton.

Timber suitable for mining and lumber purposes abounds in this whole region, and the mine is susceptible of drainage for a great number of years by an adit already commenced and running on the vein, which it will ultimately open up to the depth of 1,500 feet.

The ownership has lately been concentrated into few hands, and the crushing capacity increased to 32 stamps, which will be driven half the year by water and the rest by water and steam, when, with proper sulphuret reduction-works, the Klamath, having a large amount of rock ready to stope, some 30,000 tons by actual measurement, cannot fail to become very productive and valuable. The extent of the company's ground is 4,200 feet.

The northeast extension is owned by a company of three persons, who have a promising vein, from 3 to 5 feet in width, and opened to the depth of about 150 feet, showing gold freely. Farther on, for a distance of two miles, croppings appear at intervals above the soil, and float-rock of a rich character is found in abundance; but capital, even for prospecting purposes, has been too limited in this region to prove by development the value of these indications.

Southward, and about three miles from the Klamath, is the Black Bear, situated on the head-waters of Black Bear Gulch, at an elevation of about 4,000 feet above sea-level. This property had the usual history of bad management and ignorance of mining and milling from the period of its discovery, in 1860, to 1866, at which time it was purchased at a small figure by a company of three, who commenced operations with a 12-stamp mill erected by the old company, and by careful management succeeded in developing a mine which now ranks with the best in the State.

The company own 5,200 feet of ground, about 1,000 feet of which has been opened, the greatest depth yet reached being about 400 feet, where

the vein is fully 15 feet wide. It has generally a due north and south direction, and dips 45° , sometimes assuming an angle of 20° , as is the case in one of its most productive parts. It is inclosed in black slate, of the same nature as the Amador mines, and, like all the veins in this region, has the same characteristics and general features, except that it contains about 3 per cent. of very fine sulphurets, generally inclosed between the laminæ of the vein-matter, which is of the "ribbon" variety, with a white and bluish-black cast. The sulphurets also contain about 18 per cent. of arsenic, and yield, by chlorination, about \$75 per ton. Most of the rock shows gold freely, and requires hot water for amalgamation. The yield for the past four years has been about \$25 per ton, except one chute of rock in the north end, known as the Yellow-Jacket ground, where the rock has for several months in succession yielded from \$40 to \$60 per ton. The lower tunnel was driven a distance of 900 feet through the country, at right angles to the vein, and when driven thereon about 800 feet north will open up the Yellow-Jacket ground at a depth below the present workings of about 250 feet. The average width of the whole vein is 5 feet, and a peculiarity of the mine is the ease with which the rock is extracted, and its general profitable character from the hanging to the foot wall.

The entire property was sold last July to a company of San Francisco capitalists, who have made an addition to their mill of 16 stamps, which will run by water and steam; and, although the rock has to be hauled two miles, cheap wood, water-power, and drainage to mine combine to permit the working of the mine and mill upon a very economical scale.

A wagon-road is building, about twenty-five miles long, over the Salmon Mountains to connect with Scott Valley, a very rich agricultural region, and thus furnish all kinds of produce, flour, and beef at as reasonable rates as can be obtained in any part of the State. Moreover, the California and Oregon Railroad will pass a point within forty-five miles of the mine, furnishing all the needed facilities for transportation, the want of which is one of the greatest retarding influences heretofore operating against this little known but highly promising mining-region.

GENERAL LIST OF MINING-CLAIMS.

The following is a list of mining-claims in the State of California, plats of which have been made and copies transmitted to the Commissioner of the General Land-Office and to the register of the United States General Land-Office, during the year 1872:

Quartz-mines.

Name of mine.	County.	Character.	Length of lode.
			<i>Chains</i>
Lady Franklin.	Alpine	Gold and silver quartz ..	30.30
Clyde	Amador	Gold-quartz	18.18
D. B. Spagnoli	Do	do	19.69
Eclipse	Do	do	7.48
El Dorado	Do	do	18.18
Gover	Do	do	13.32
Hardenbergh	Do	do	32.24
Hazard	Do	do	20.08
Italian	Do	do	4.58
Last Chance	Do	do	18.48

Quartz-mines—Continued.

Name of mine.	County.	Character.	Length of lode.
			<i>Chains.</i>
North Star	Amador	Gold-quartz	16.87
Oaks	Do	do	18.18
Summit	Do	do	17.66
Nevada	Do	do	25.59
Nisbet	Butte	do	44.80
Angels	Calaveras	do	14.07
Bovee	Do	do	6.90
Carson Creek	Do	do	15.16
Chaparral Hill	Do	do	19.67
Dead Horse	Do	do	4.55
Everlasting	Do	do	45.45
Finnegan	Do	do	16.28
Gwin and Coleman	Do	do	57.57
Hudson	Do	do	36.37
North Paloma	Do	do	18.18
Mineral Mountain	Do	do	40.74
Plymouth Rock	Do	do	18.18
Reserve	Do	do	13.78
San Bruno	Do	do	12.12
Santa Cruz	Do	do	30.30
Stickle	Do	do	6.06
Melones or Point Rock	Do	do	29.30
Tecumseh	Do	do	45.45
Union Company's	Do	do	36.36
Woodhouse	Do	do	45.45
Wolverine	Do	do	15.15
Poor Man	Do	do	18.18
Bobby Burns	El Dorado	do	21.21
Chouleur	Do	do	23.50
El Dorado	Do	do	24.48
Eureka	Do	do	22.80
Coyote Hill	Do	do	9.09
German	Do	do	30.30
Gopher	Do	do	54.62
Greenwood	Do	do	22.72
La Moille	Do	do	24.45
Maryland	Do	do	42.42
Pacific	Do	do	28.70
Fort Yuma	Do	do	23.36
Sliger	Do	do	8.03
Sugar-Loaf	Do	do	15.14
Swansea	Do	do	27.27
Rocky Bend	Do	do	27.27
Yellow-Jacket	Do	do	37.00
Diltz	Mariposa	do	13.03
Eddy	Nevada	do	19.10
J. M. English	Do	do	44.40
Lone Jack	Do	do	16.66
Marietta	Do	Gold and silver quartz ..	45.45
Nevada	Do	Gold-quartz	45.75
New York Hill	Do	do	43.10
Norambagua	Do	do	48.48
Saint John	Do	do	37.88
Sulphuret	Do	Gold and silver quartz ..	33.33
Wisconsin	Do	do	37.87
Wisconsin	Do	Gold-quartz	12.95
Morehouse	Do	do	27.27
Baker	Placer	do	15.15
Butcher Boy	Do	do	12.12
Cræsus	Do	do	22.73
Empire	Do	do	30.30
Empire	Do	do	22.72
Eclipse	Do	do	37.50

Quartz-mines—Continued.

Name of mine.	County.	Character.	Length of lode.
			<i>Chains.</i>
Greene Walter	Placer	Gold-quartz	24.02
Ophir	Do	do	25.30
Sally Jones	Do	do	22.72
Salsig Extension No. 1	Do	do	13.75
Secret Cañon	Do	do	30.30
Olio	San Bernardino	do	18.20
San Bernardino	Do	do	15.22
Mammoth	Do	do	18.21
Banghart	Shasta	do	45.45
Independence	Sierra	do	75.75
Independent	Do	do	24.24
Keystone	Do	do	45.45
Shores	Siskiyou	do	27.27
App	Tuolumne	do	14.82
Confidence	Do	do	16.22
North Confidence	Do	do	17.34
Mammoth	Do	do	33.35
Patterson	Do	do	27.79
Waters	Do	do	21.22
Lucan	Yuba	do	45.44

Total number of quartz-mines, 93.

Placer-mines.

Name of mine.	County.	Character.	Area.
			<i>Acres.</i>
Hall & Co.	Amador	Gold-placer	40.00
Sorocco	Do	do	40.00
Clear Creek	Butte	do	160.00
Cataract	Calaveras	do	160.00
Chile Gulch Fluming Co.	Do	do	10.82
Red Hill	Do	do	40.00
Wide West	Do	do	160.00
Crane's Gulch	El Dorado	do	80.00
Dead-Head	Do	do	160.00
Georgia Slide	Do	do	158.50
Grigg's Ranch	Do	do	128.16
O'Brien & Tulley	Do	do	20.00
Olsen & Donaldson	Do	do	60.14
Railroad	Do	do	30.00
Rising Hope	Do	do	100.00
Rowe & Co.'s	Do	do	40.00
Sailor Slide	Do	do	29.66
Shoemaker	Do	do	80.00
Badger Hill and Cherokee	Nevada	do	116.82
Baltic Gravel-Mining Company	Do	do	110.00
Bed-Rock Tunnel	Do	do	43.52
Biggs	Do	do	215.24
Central	Do	do	163.13
Enterprise	Do	do	179.61
Horace Kilham	Do	do	356.47
Harmony Co.'s	Do	do	138.53
Keystone	Do	do	155.53
Montreal	Do	do	89.23
Murchie	Do	do	100.00
San Juan Union	Do	do	136.44
Simon H. Dikeman	Do	do	60.00

Placer-mines—Continued.

Name of mine.	County.	Character.	Area.
			<i>Acres.</i>
South Yuba Canal Company	Nevada	Gold-placer	130.00
Wolcott	Do	do	149.10
North Fork and Bear River	Nevada and Placer	do	160.00
Middle Yuba	Nevada and Sierra	do	90.35
Ada Bell	Placer	do	74.98
Bear River	Do	do	137.86
Big Channel	Do	do	365.55
Big Spring	Do	do	116.53
Bradley & Garduer	Do	do	88.36
Bumpus Cañon	Do	do	127.95
Church and Golden Gate	Do	do	334.14
Dutch Flat and Franklin	Do	do	155.00
Dutch Flat Cañon	Do	do	117.43
Elmore Hill	Do	do	44.64
Frank Hoffman	Do	do	160.77
Franklin Miner	Do	do	103.11
Garland Mill Slope	Do	do	158.14
Green Spring	Do	do	59.00
Indiana Hill Hydraulic	Do	do	63.70
Manhattan	Do	do	157.39
Mutual	Do	do	21.08
Nary Red	Do	do	224.32
Oro & Dardanelles	Do	do	312.77
Pond & Constable	Do	do	206.41
Powell	Do	do	140.10
Red Hill	Do	do	24.66
Sailor or Brown & Co.	Do	do	91.46
United States	Do	do	229.42
Weske	Do	do	156.34
Yule & Willey	Do	do	145.24
Garvey	San Bernardino	do	141.75
Dixon & Cooper	Shasta	do	20.00
McMullin & Reese	Do	do	110.00
Anderson Gulch	Siskiyou	do	28.23
Benton Gulch	Do	do	15.83
Brown & Murray	Do	do	27.64
Goodale & Williams	Do	do	60.00
Hull Gulch	Do	do	81.36
James William Fox	Do	do	84.40
Jourdan Gulch	Do	do	62.64
Leduc	Do	do	105.00
Marfield & Co	Do	do	37.50
Pellet & Truitt	Do	do	35.29
Smith & Hand	Do	do	13.23
Sucker Flat	Do	do	57.12
Wright & Co.	Do	do	58.86
Van Doozer Gulch	Do	do	95.24
Tuttle Gulch	Do	do	159.68
Bed-Rock Tunnel	Trinity	do	12.35
Dannenbrink	Do	do	39.94
Garden Gulch	Do	do	86.07
H. C. Wilt	Do	do	53.10
Oregon Gulch Mountain	Do	do	159.43
Tom Bell	Do	do	39.86
Finn	Tuolumne	do	30.00
Hilton & McPherson	Do	do	60.00
Richards	Do	do	140.00
Nevada Mining Company	Yuba	do	154.86
Ohio Flat	Do	do	60.00

Total number of placer-mines, 90.

Placer-mine with quartz-lode.

Name of mine.	County.	Character.	Length of lode, (quartz.)
Wet Gulch	Calaveras.	Quartz and placer gold....	33.33 chains. Area, (placer,) 78.20 acres.

Total number of placer-mines with quartz-lode, 1.

Quicksilver-mines.

Name of mine.	County.	Character.	Length of lode.
			<i>Chains.</i>
Gem	Lake	Quicksilver	45.45
Pittsburgh	Do	do	68.68
Don Juan	Monterey	do	45.45
Don Miguel	Do	do	45.45
New York	Do	do	45.45
Pennsylvania	Do	do	45.45
Napa	Napa	do	45.45
Pope	Do	do	45.45
Silver Bow	Do	do	27.27
Valley	Do	do	45.45

Total number of quicksilver mines, 10.

Copper-mines.

Name of mine.	County.	Character.	Length of lode.
			<i>Chains.</i>
Cosumnes	Amador	Copper	71.09
Calaveras	Calaveras	do	45.45
Keystone	Do	do	50.00
Union	Do	do	28.75
Last Chance	Nevada	do	36.36

Total number of copper-mines, 5.

Iron and copper mine combined.

Name of mine.	County.	Character.	Length of lode.
			<i>Chains.</i>
Tyson	Tuolumne	Iron and copper	13.64

Total number of iron and copper mines, 1.

RECAPITULATION.

Quartz-mines	93
Placer-mines	90
Placer-mine with quartz-lode	1
Quicksilver-mines	10
Copper-mines	5
Iron and copper mine combined	1
Total	200

List of United States deputy mineral-surveyors for the State of California, appointed under the provisions of the act of Congress approved May 10, 1872.

Name.	Address.	County.	Date.
Thomas J. Dewoody	Napa	Napa	June 1, 1872.
Andrew B. Beauvais	Columbia	Tuolumne	June 1, 1872.
William L. McKim	Jackson	Amador	June 1, 1872.
James M. Anderson	Placerville	El Dorado	June 1, 1872.
Henry F. Terry	Mokelumne Hill	Calaveras	June 1, 1872.
Charles W. Hendel	Downieville	Sierra	June 1, 1872.
James McGann	Chico	Butte	June 1, 1872.
William Magee	Shasta	Shasta	June 1, 1872.
J. C. Partridge	Susanville	Lassen	June 1, 1872.
W. L. Lowden	Weaverville	Trinity	June 1, 1872.
William Sharp	Yreka	Siskiyou	June 1, 1872.
A. M. Jones	Yreka	Siskiyou	June 1, 1872.
Samuel Bethell	Auburn	Placer	June 1, 1872.
John Goldsworthy	Los Angeles	Los Angeles	June 1, 1872.
William P. Reynold	Los Angeles	Los Angeles	June 1, 1872.
Jarvis Kiel	Mariposa	Mariposa	June 1, 1872.
Edward C. Uren	Dutch Flat	Placer	June 1, 1872.
Benjamin Ross	Volcano	Amador	June 1, 1872.
Lucius F. Cooper	Yreka	Siskiyou	June 1, 1872.
Edward B. Eddy	Nevada City	Nevada	June 1, 1872.
Newton C. Miller	North San Juan	Nevada	June 1, 1872.
W. S. Cooper	Sonora	Tuolumne	June 1, 1872.
J. A. Benson	Auburn	Placer	June 1, 1872.
William Jabine	Placerville	El Dorado	June 1, 1872.
M. A. Wallace	San Bernardino	San Bernardino	June 1, 1872.
Arthur W. Keddie	Quincy	Plumas	June 1, 1872.
George Tucker	Lakeport	Lake	June 1, 1872.
M. V. Bennett	Santa Cruz	Santa Cruz	June 1, 1872.
Henry Powell	Sweetland	Nevada	June 1, 1872.
John T. Stockton	Red Bluff	Tehama	June 1, 1872.
H. H. Sandford	Woodland	Yolo	June 1, 1872.
Alexander McElroy	Hornitos	Mariposa	June 1, 1872.
Robert R. Harris	San Luis Obispo	San Luis Obispo	June 1, 1872.
J. A. Rousseau	San Bernardino	San Bernardino	June 1, 1872.
Ross E. Browne	San Francisco	San Francisco	June 1, 1872.
Charles F. Hoffman	San Francisco	San Francisco	June 1, 1872.
C. S. Bulkley	San Francisco	San Francisco	June 1, 1872.
H. S. Craven	San Francisco	San Francisco	June 1, 1872.
Alfred Craven	San Francisco	San Francisco	June 1, 1872.
John B. Treadwell	San Francisco	San Francisco	June 1, 1872.
Hugh Barker	Placerville	El Dorado	June 1, 1872.
A. A. Smith	Susanville	Lassen	June 1, 1872.
Gustavus Cox	San Francisco	San Francisco	September 10, 1872
M. G. King	San Francisco	San Francisco	June 1, 1872.
Isaac G. Jones	Downieville	Sierra	October 14, 1872.
G. F. Deetkin	Grass Valley	Nevada	September 1, 1872.
Elijah W. Brown	Smartsville	Nevada	October 21, 1872.
William Edmunds	Oroville	Butte	October 21, 1872.

CHAPTER II.

NEVADA.

The mining-industry of this State has been more productive during the year 1872 than in any former year, bringing the State to the foremost position in its yield of precious metals. Detailed accounts of the different districts are given below. It may be said, on the whole, that the smelting-works of Nevada have not been so prosperous as in the preceding year, owing partly to increased scarcity and dearness of charcoal, partly to vexatious litigations, causing stoppage of operations, and, in one case, to the diminution in value of the ores smelted. These losses have been more than compensated by the great activity of the stamp-mills, and particularly the productiveness of the Comstock and Pioche mines. The outlook for 1873 is favorable.

The bullion product, as given by Mr. Valentine, superintendent of Wells, Fargo & Co.'s Express, is \$25,548,811, an estimate which I regard as a close approximation. The following table, compiled from sources independent of the express shipments, corroborates Mr. Valentine's estimate, and indicates at the same time the distribution of this production :

Comstock mines and tailings.....	\$13,569,724
Lincoln County	5,500,000
Lander County	3,495,000
Humboldt County	600,000
White Pine County.....	785,000
Nye County	450,000
Elko County.....	450,000
Esmeralda County	93,000
	24,942,724

The difference of \$606,087 is probably to be ascribed to the shipments from Virginia and Gold Hill, which are always much larger than the aggregate of the reports obtained from separate mines. The elements of the estimate above given of \$13,569,724 for the Comstock are given below; and it will be seen that many small outlying mines are not included.

THE COMSTOCK MINES.

I am indebted for the facts given below to the reports of the various companies, and to the admirable notes furnished me by Mr. Cesar Luckhardt, a resident of San Francisco, formerly an engineer on the Comstock, and thoroughly familiar with every foot of the mines. Mr. Luckhardt visited Virginia City at my request for the express purpose of making personal examinations.

To facilitate description, the division of the explored ground on the Comstock given in former reports is adhered to in the present, viz :

1. The northern portion, from the Utah mine to the Chollar, 12,200 linear feet.

2. The middle portion, from Chollar to the Imperial North, 1,795 feet.

3. The southern portion, from Imperial North southward, to the extent of 6,000 feet.

Since the commencement of 1872, extensive explorations have been carried on, amounting in the aggregate, as near as can be ascertained, to 5,600 feet of shaft and incline and 35,400 feet of drifts, which have been run in the 21,000 feet of ground, as above divided.

1. *The northern portion of the vein.*—Beginning with the Utah mine and passing southward, we have to deal so far with eight separate ore bodies.

1. The first, which was explored in the Utah and afterward in the Sierra Nevada, proved to extend over 340 feet in length, yielding ores of a mill-value of \$4 to \$12 per ton, carrying principally free gold. The main bulk of this body existed in the Sierra Nevada, which company has extracted a large amount of ore from it, and has still much unworked ground; but, owing to the irregularity of the occurrence of its ores, it is impossible to estimate, with any degree of accuracy, the amount still standing. In all probability the smaller tributaries to this body will keep the Sierra Nevada Company at work for some time to come, making profitable mining a possibility through the company's mill, which is situated at the mine. The ground below this body has been explored to a depth of 700 feet vertically. The present shaft-bottom is now 60 feet east of the west wall of the Comstock. Cross-sections have been made for 230 feet east and west, and 900 feet north and south, but without success in discovering any new body of ore. The vein was found 200 feet wide, consisting of porphyritic material, with intersections of small seams of quartz. At a place 150 feet vertically below the mouth of the shaft, and 200 feet northeast of it, in what is called the Cedar Hill Tunnel, 60 feet of quartz-width has been cut through, barren of ores, but looking favorable for the finding of ore.

2. Going northwestward from the above, that is, following the outcrop of the Comstock, work was commenced on a large mass of low-grade ores by the Sacramento, Texas, and other companies, (all of which ground is now owned by the Sierra Nevada Company.) This ore-mass does not stand in direct connection with the above body, but lies west of it, has been worked for 100 feet vertically, and is known to descend over 250 feet below the outcrop. Its ores carry also principally gold, and vary from \$7 to \$9 per ton in mill-yield. The Sierra Nevada Company has explored these two bodies of ore for nearly 2,000 feet north and south, and in all probability will have over one year's ore, varying from \$4 to \$9 per ton, to work upon.

3. Going south, we come to the third ore-body, (in my former report of 1869 called No. 2,) which coursed through a portion of the North Ophir, Central, South Ophir, and part of the California ground, where it yielded formerly ores of extraordinary richness. It is practically exhausted; some low-grade ores, slides from the main body, are still standing, but no attention has as yet been paid to them, and their extent is not known. Its extension northward has never been explored. Beyond 300 feet north of the Mexican Company's north line to a depth of 250 feet, its ores become "base," carrying much zinc-blende, manganese, and in places galena, and are unfit for treatment at present. The Ophir Company has carried on explorations from its new shaft to a vertical depth of 1,465 feet, and has cut east for 350 feet, not meeting the east boundary as yet, showing the vein, so far, 300 feet wide. The western portion, for 175 feet, is porphyritic material, intermixed with quartz.* Bounding this on the east are 75 feet width of quartz, followed further east by the same material, which is found to the west. This quartz has

* This western mass is found all along the vein wherever prospected.

been explored for 100 feet north and south, and for 45 feet vertically, and is an entirely new feature. It carries from \$2 to \$6 in gold and silver— $\frac{1}{4}$ gold, $\frac{3}{4}$ silver. It has a southeast dip, and, so far as explored, shows an inclination southward identical with that of the upper body, (which pinched out 1,010 feet vertically above this point,) described in former report. It looks favorable for ore, and is, without a doubt, the prolongation northward of the quartz which carries the ore-body lately found in the Virginia Consolidated, (see below, No. 4.) Although the vein has been explored at this depth for 164 feet north and south, nothing of value has as yet been found. Northward, this quartz becomes intermixed with much porphyry, and the vein shows much irregularity. The 1,300-foot-level of Ophir has been explored for 80 feet northeast, to find this quartz-body of the lower level, but without success. The 1,100-foot level exposed the vein for 830 feet north and south by 200 feet east and west, showing 64 feet vein-width, of which the western portion (50 feet) consisted of porphyritic material with narrow quartz seams, while the eastern portion is quartz, assaying from \$1 to \$7 per ton in gold and silver. This is the quartz of the 1,465-foot level, but only 14 to 15 feet wide here in the 1,100 level; it has a dip east, inclination south, and has been followed here south to within 50 feet of the Ophir south line, and downward, its dip showing indications of ore all the way, but not any pay-ore as yet.

4. Farther south, the ground from the Central Company to the Gould & Curry, about 1,400 feet in length, which had been left entirely unprospected to within a short period, (except a little work done by the California Company and White & Murphy Company in former years to a depth of 400 to 500 feet, vertically,) has been proven to contain an entirely new ore-body. The Sides, White & Murphy, Kinney, and California Companies' grounds form the present Virginia Consolidated Company, which commenced work vigorously, both by sinking a vertical shaft and exploring the ground from the 1,167-foot levels (measured from the shaft-mouth) of the Gould & Curry mine. The Virginia Company's shaft proper, 700 feet north of the company's south line, is 715 feet deep at present. At a depth of 500 feet the ground was explored westward for 900 feet, and 1,100 feet north and south, showing the vein 150 feet wide on the south, and 170 feet directly west of the shaft, carrying quartz and quartzose material, intermixed with porphyries, but barren of ore. The drift coming from the Gould & Curry 1,167-foot level has penetrated thus far 260 feet directly north into the Virginia Consolidated Company's ground. The connection of this with the shaft, requiring 310 feet drifting, and 380 feet sinking of shaft, will occupy three and a half months yet. The drift has exposed, 180 feet north of the company's line, the quartz of this ore-body 3 feet wide, running northeast, and dipping east. It has been followed, so far, for 280 feet horizontally; cross-sections show it to widen gradually to 48 feet at the northernmost point yet reached. This longitudinal drift run in it produced 800 tons of \$23 milling-ore, whence it may be inferred that this body is two-thirds waste and one-third ore. As work progresses north it continues to widen, and has every appearance of forming into a very valuable ore-body, judging from its length already developed, and considering that the lowest level of Ophir, 1,200 feet northeastward, shows this identical quartz. There are over 800 feet of height and over 1,200 feet in length to prospect yet above this 1,167-foot level of the Virginia Company.

5. South from the above, starting in the Gould & Curry, and extending for 2,400 feet horizontally into the Hale & Norcross, we have

that body, enumerated as No. 3 in my report of 1870, which has produced over \$17,000,000 during the past five years. Although in 1870 considered exhausted at a vertical depth of 1,100 feet below the croppings, it has yielded, and still continues to yield, from its parallel seams and tributaries. For instance, the Savage Company realized over 50,000 tons of milling-ore from it in 1872; and the daily product from it now (March, 1873) varies from 900 to 1,000 tons of ore of \$19 to \$21 milling value. The Gould & Curry are now at work on their old second level near the Savage line, in order to extract some ore left standing there from this body; but it has ceased to yield ores in depth in that mine.

The Gould & Curry ran 5,300 feet of drifts and sank 440 feet of shaft and incline during the past year, reaching 1,794 feet, (measured from the cropping,) *i. e.*, 1,500 feet vertically, and 294 feet on an incline below. The vein has been explored at 1,600-foot depth for 200 feet north and south; for 200 feet east it proved to dip 60° east. The principal portion of the vein consists of porphyries with small seams of quartz. The 1,500-foot level explored the ground for 600 feet north and south, and proved the vein to be over 400 feet wide. An eastern cross-cut of 430 feet in length disclosed mostly porphyritic material with small quartz-seams; but at the face 6 feet of quartz with some good ore-spots has been found, which looks promising for ore. Work is in progress north on it. This quartz is divided from the western porphyritic masses by a little clay. The 1,300-foot level has been extended all along the vein from the north to the south line of the company's ground, and prospected for 150 feet east, but nothing but porphyritic material was found. The 1,167-foot level has also longitudinal drifts from north to south line; western cross-drifts from 200 to 300 feet long exposed much more quartz and porphyry than any of the other levels did; 260 feet north of the shaft the quartz is 100 feet wide, carrying but traces of ore. When followed northward, crossing the Best & Belcher ground, it led into the ore-body lately developed in the Virginia Consolidated ground, and above described.

The Savage mine has penetrated 1,500 feet vertically, and thence followed the west wall to a depth of 250 feet, at an angle of 38°. The lowest or 1,700-foot level has followed the vein 120 feet south so far, where several feet of quartz were encountered, hugging a clay seam to the eastward, both of the same character as that of the Gould & Curry. The extent of this quartz is as yet unknown, as is also the width of the vein. It is evident that the ore which occurs in this quartz does not belong to that of the ore-body enumerated as No. 5. The 1,600-foot level has explored the vein along its course for 730 feet north and south, and, so far, 120 feet east, without finding the east boundary as yet. The northern portion of the mine here shows the matrix to consist chiefly of porphyries, while the southern portion (*i. e.*, south of the shaft) consists mostly of quartz and quartzose material for 100 feet in width, and, so far, 190 feet in length, with seams of good ore, assaying from \$10 to \$20 per ton. Mr. Luckhardt thinks this is the same quartz as that of the lower level, and also that of the Hale & Norcross tenth and twelfth levels, (see No. 6 below,) but is not certain. Explorations are now going on east and west in this ore-bearing quartz, and very good ore-seams are encountered at intervals. Taking into consideration the developments of these two levels—namely, the width of the quartz, indicating strength, the straightening of the quartz below the 1,600-foot level, the difference of the character of the ore here from that of the upper levels belonging to ore-body No. 5—it cannot well be denied that the prospect for a new ore-body is good; but the explorations are as yet too limited

to warrant a decisive conclusion. The twelfth, or 1,500-foot level, met ore 60 feet north of the company's shaft-line—but only 10 feet wide—and 58 feet below this level it closed out. It extends upward to the eleventh station and 50 feet above it, where it closes out also, making a vertical ore-depth at the company's south line of 200 feet. The eleventh or 1,400-foot level showed ore, poor and in seams, for 30 feet wide in places, nearly all of which has been extracted; the month of March, 1873, only producing 41 tons of \$27 (assay) from this 1,400-foot level. Neither the 1,400 nor 1,500-foot levels showed any new developments in the workings of 430 feet north and south on the course of the vein by 140 feet in width. The tenth or 1,300-foot level followed the vein 420 feet, north and south, showing it 210 feet wide, but barren of ore. Above this level ore-body No. 5 gave out.

During the past year much ore has been extracted from the upper portion of body No. 5 out of the works of the north mine of Savage, (second and sixth levels,) where even now 1,000 to 1,100 tons are extracted monthly, of an average assay-value of \$50 per ton.

6. The Hale & Norcross Company has attained a total depth of 1,760 feet; the shaft is vertical for 1,208 feet. The bottom of the incline is 600 feet east of the vertical shaft. During the past year the ninth, tenth, eleventh, and twelfth stations have been opened. The old ore-body, No. 5, has been worked out, and the parallel body which showed itself in the seventh level, north mine, for 300 feet in length from the company's north line, varying from 20 to 40 feet in ore-width, and which Savage worked to 60 feet below their twelfth level at their south boundary-line, (see No. 5 above,) has also been worked in the eighth level 180 feet long, north and south, varying from 20 to 25 feet of ore-width, and on the ninth level was 10 feet wide; but in two patches, lying very irregularly below this level, trailed itself out against its western clay, which forms the dividing line between the ore-body and the quartzose porphyritic material immediately overlying the west wall. One detached small body was found and extracted 50 feet south of the main incline. All of this ore lay in the north portion of the company's mine, and yielded the principal product of the year. Only a small quantity of ore, of \$20 to \$25 assay-value, is left standing. At a point 100 feet south of the Savage south line, and 50 feet below the ninth level, the two clays, which bound this quartz-body on the east and west, came in close neighborhood; the quartz was not over 8 inches wide between them; but as it was followed downward it widened again from 6 to 8 feet, carrying ore of \$20 to \$35 assay-value, which has been followed by an incline down to the twelfth, or lowest level, and now yields ores from the tenth and twelfth levels. The irregularities of this new body are probably produced by a dike of hard, dark, compact porphyry, (foreign to the porphyries which have heretofore formed part of the vein-stuff above,) which has just been encountered in the lowest level lying to the east. It seems to be a mass of considerable size, but nothing can be said as to its position and extent as yet. The South mine, in these lower levels, (*i. e.*, from the ninth to the twelfth levels,) has developed nothing so far. The ninth level was run for 100 feet south, showing quartzose material, but principally porphyries, filling the vein. Eastward much clayey matter was encountered and an abundance of water; and for fear of swamping the mine prospecting east was abandoned, although no east wall had been developed. Further prospecting eastward would possibly develop the "lap" of the upper body. Northward this level was extended to the Savage line where the quartz began to concentrate more, until it became 60 feet wide, showing ore in spots and narrow seams, (assay-

ing often over \$200 per ton,) until at last the above-described body was found, below where the clays united. The tenth level also was run south without good results. The vein was found 75 feet wide; northward the ore-body from above was found to widen. The eleventh level was opened westward for 60 feet west of this ore-body, showing no new features, and no work has been done north or south in this level as yet. The twelfth level (lowest) was opened along the vein for 315 feet, north and south, to within 40 feet of the Savage line, principally eastward from the ore-body, and connected with the upper levels by the winze. An east cross-cut has been run, showing thus far 80 feet width of vein-matter, bounded on the east by the above-mentioned dike or intrusion of hard porphyry, having no clay division between it and the matrix, and resembling much those horses which occur in the Empire, Imperial, and Justis mines, at and south of Gold Hill. This mass has, perhaps, caused the coming together of the two clays below the ninth level, and the apparent irregularity north in this twelfth level, and will by its size, shape, and dimensions govern the position of the quartz and ore body west of it. This ore-body, although followed downward for 300 feet by incline, has not been laid open to view sufficiently to permit an estimate as to the quality and quantity of its ores; but it is doubtless the same body as that which has been penetrated in the Savage Company's two lower levels, east of the western quartz.

7. Within the past year work has been carried on in the old stopes, and into the old upper mine of the Hale & Norcross, in search of parallel seams of the ore-body enumerated as No. 5, and the product of both has been, for the year, 24,000 to 25,000 tons of ore of \$25 assay value. In the second or 810-foot level occurs a repetition of the phenomenon of the Savage "Potosi Chimney," described in 1870, lying parallel with the main body No. 5. A distance of 63 feet eastward from it, and divided by quartz and clayey material, another body of ore was encountered 120 feet from the Chollar Potosi Company's north line. It yielded ore in seams for 8 to 40 feet in width, not of as good a quality as that of the main body, but resembling the latter in character, and entirely different from the ores of the tenth to the twelfth station. It has been opened for 156 feet vertically and 132 feet north and south so far, and has, like the other body, a southern inclination. Explorations from the level above and below the 810-foot level are in progress to determine its extent. It has thus far yielded 1,400 tons of the 25,000 tons above enumerated, and will continue to yield large quantities of ore.

8. Passing to the Chollar Potosi, we have that ore-body, which has been worked for years from the surface, to a depth of 650 feet, and over 1,000 feet horizontally. It was in places 300 feet wide from east to west, and was in 1868 abandoned as exhausted; but it yielded last year over 41,000 tons of \$24 to \$28 mill-ore, and will from present developments yield at least 15,000 to 18,000 tons more.

The east shaft has been connected with the works of this body, and used as an exit for its ores. During the process of overhauling the old works, many ore-chambers were developed. For instance, in the northern portion of the mine, in what is known as the "Piute Chamber," a patch of ore was worked for 96 feet vertically and 15 to 30 feet wide, yielding \$20 mill-ore. Lying parallel with the body called "Blue Wing," a western seam was attacked which yielded ore for 200 feet vertically. Going south from here, the Belvidere ore-chamber was found, which alone has yielded over \$2,000,000; it extends from the surface to the 178-foot level of the new shaft, (making over 300 feet on its dip,) and to within 400 feet north of the Bullion Company's ground, and has proved

to be 50 feet wide. Below this 178-foot level, one seam from it, now followed downward, shows 2 feet wide of \$50 ore, which promises also a large yield. In all this western work, the Chollar Company has at least 15,000 tons of \$20 ore left; a closely correct estimate cannot well be made. After the destruction of the hoisting-works by fire in 1869, work in depth had been abandoned; but since their re-erection the vein has been prospected through the first and second levels further east than it had been before, but without success in finding anything of value there. The 725-foot level was re-opened and work pushed north, in search of ore-body No. 7, which was left 45 feet wide in the Hale & Norcross second level, but so far no developments of note have been made. The distance to explore is 353 feet to the company's north line.

II. *The middle portion of the vein.*—This reaches from the Chollar Potosi Company's ground to the Imperial North, (1,800 linear feet,) including the Bullion, Exchequer, Alpha, Treglone, and Imperial North.

The two existing ore-bodies here have been exhausted, except in the Imperial North, which still produces a few tons daily from the westerly body, but of low grade. No new ore-developments have been made in this ground within the past year.

The Bullion having attained a depth of 1,400 feet, showing 50 feet quartz-width, but carrying little or no ores, except in spots, the lower works were abandoned. At the 800-foot level the ground was explored for 500 feet east, disclosing the vein 100 feet wide with 60 feet of quartzose material, but no ore. The predictions of an expert with a "divining-rod" caused the company to cross-cut westward into Mount Davidson for 400 feet, piercing strata of syenitic rock with intersections of quartzose material at intervals of 40 to 50 feet, varying from $\frac{1}{2}$ to 2 inches in thickness, but naturally barren of ore. It is the intention of the company to sink a new shaft 900 feet east from their present one, which from its proposed locality would be 300 feet east of the west wall, at a depth of 1,500 feet, in order to prospect from it.

The Alpha, Exchequer, and Treglone have lain idle.

III. *Southern portion of the vein.*—In this portion, extending from the Imperial North to the Caledonia, we have to record nine separate ore-bodies; four of them have been exhausted of their ores, viz:

1. That which extended from Alpha to Imperial, south, 850 feet in length, to a depth of 300 feet.

2. The parallel body east of No. 1, commencing in the Empire North, near the surface, and extending into the North Yellow Jacket to a depth of 500 feet.

3. That western body which extended from the north portion of the Belcher into the Imperial ground to a depth of 460 feet, and which yielded so well in the Kentuck and South Jacket mines.

4. The largest body, which lay east of the above, was discovered at first in the 500-foot level of the Crown Point. It had its southern terminus 300 feet north of the Belcher Company's north line, near the 400-foot level, and its northern in the 100-foot level of the Yellow Jacket, 230 feet north of the Jacket shaft. The large quartz-mass in which this body was imbedded, did not close out in either of these mines, but, on the contrary, gaining strength southward and downward, can to day be traced from the Belcher to the Imperial, and in fact contains the new ore-body of Belcher and Crown Point. (See No. 9 below.)

The five other bodies have not been exhausted, viz:

5. That very irregular body which coursed through Segregated Belcher into Overmann and beyond, has yielded largely in ores for 1,400 feet north and south; most of its ores are extracted, but in all probability it

will continue to yield low-grade ore for some time to come. Estimates cannot well be made concerning it.

6. That west body which extended from Alpha into Crown Point, and which has yielded ores with interruptions for over 2,640 feet in length, is not yet fully exhausted. It was found to extend into Belcher also. Although not yielding ores at present, the day is not far off when its reserves will be attacked. It is impossible to estimate the quantity of ore left standing in this body.

7. A mass of ore, without definite course or dip, in which gold predominates largely over silver, lies to the east and southeast of those already enumerated. Commencing northwest from the Justis it extends southeast for over 1,500 feet into the Lucerne and Silver Hill, &c., and has yielded largely in ores worth from \$5 to \$9 per ton, of which a large amount is still standing. There is, in fact, an area of nearly 2,000 feet square which would well repay a thorough system of prospecting by the different companies owning it. (See remarks below.)

8. Commencing in the Empire ground a new body of ore has been found between the 1,600 and 1,700-foot levels of Empire, 220 feet south of the incline, on the same plane with the 1,300-foot level of the Yellow Jacket mine. It lies 90 feet west of that quartz-mass which carried the ore-body No. 4, above named. Its extent is as yet unknown, although its prolongation southward shows itself in the Yellow Jacket mine at this level, in small stringers in the connection-drift of Jacket and Imperial throughout. The ores are remarkably free from base metals and carry a high percentage in gold. So far 6 to 7 feet width and 40 feet depth of \$45 to \$50 mill-ore has been discovered. The predominant portion of the matrix is quartz, but carbonate and sulphate of lime are intermixed to a much larger extent than at the upper levels of the Imperial, and the 800-foot level of the Bullion, where the same kind of material showed itself, but barren of ores. It is impossible, from the present limited explorations, to calculate its importance. The ores are very similar to the rich ores found in the seams imbedded in the larger bodies, which have been exhausted in the Kentuck and Jacket; and they also resemble in their general nature those of the other new body (No. 9, below) of Belcher and Crown Point. The apparently undisturbed crystallization of the matrix leads to the belief that these ores must belong to good-sized masses, rather than to small deposits; but, on the other hand, all the large Comstock ore-bodies cross the vein-fissure transversely, originating at or near the foot-wall, and finding their terminus at or near the hanging-wall, so that from analogy we would have to look for the main bulk of this body overhead rather than below. Nevertheless, considering that the two ore-bodies found in this portion of the Comstock overhead stood nearly vertical, whilst those north of them inclined southward, and all those south of them inclined northward, it seems possible that this new body may be an exception to the prevailing form. At all events this development is looked upon by nearly every one capable of an opinion as very promising for the finding of a large ore-deposit. The admixture of lime-rock with the quartz proves that it does not belong to any of the upper ore-bodies heretofore found.

9. The other new ore-body, first encountered in the 1,000-foot level of Crown Point, in November, 1871, 200 feet from the Belcher north line, and 440 feet eastward from the shaft, lying immediately east of the region where body No. 4, above enumerated, trailed itself out, has thus far been proved to be 775 feet in length, varying from 36 to 115 feet in width, and is known to exist for 450 feet in depth. It carries ores varying from \$30 to \$80 mill-yield per ton, which are, contrary to all expect-

tations, remarkably free from iron, copper, and zinc ores, carry a higher percentage in gold than the upper bodies did, and are readily beneficiated up to 70 per cent. of their value by amalgamation. The matrix, where the body nears the old western quartz-body, shows but a small percentage of lime-rock, which increases, however, eastward and downward. It has yielded thus far over \$10,000,000 worth of ore, and what now stands in view will in all probability give as much more. The yield in March, 1873, was \$1,500,000. To more fully describe the ground containing these nine bodies:

The Imperial Empire has reached through its shaft and incline a vertical depth of 1,785 feet, *i. e.*, 1,360 feet vertically and 610 feet further at 45°. At the 1,600-foot level the vein has been explored for 350 feet north and south, showing vein-matter over 100 feet wide, with 30 to 35 feet quartz-width, carrying spots of ore, but of no practical value. The first signs of compact ore were found 50 feet east of the incline in this level in May, 1871, and assayed as high as \$80 per ton, carrying much free gold in a quartz-width of 20 feet. Since then the 1,700-foot level has been opened, and the 1,630-foot level connected with the 1,300-foot level of the Yellow Jacket mine. A winze sunk from the 1,600 to the 1,700-foot level has developed so far 7½ feet ore-width; its actual width is not known yet. Nothing of consequence has been developed in the upper levels, and the only reserves of ore are a few scattered pillars left of former workings, in the upper western body, in the so-called Mina Alta.

The intervening ground to the Yellow Jacket mine, viz, Bacon, Bowers, Gold Hill Quartz, Eclipse, French, and Confidence, making 339 feet, has not prospected any. Some of these companies have extracted low-grade ores left in the upper levels, which are now, however, practically exhausted.

The Yellow Jacket mine has attained a depth of 1,500 feet, viz, 1,125 feet vertically, and 450 feet further at 45° east. Within the past year the 1,300, 1,400, and 1,500 foot levels have been opened. In the 1,100-foot level, the western portion of the vein for 150 feet consists of the same material as constitutes the western (quartz and porphyry) quartz-body so called of the Comstock throughout. Beyond this, 150 feet, a little clay divided it from 20 feet of quartz-width, which, to all appearances, is the northern extension of the quartz-body in which lies the Belcher and Crown Point ore-body referred to above as extending from the Belcher into the Imperial. This 1,100-foot level followed the quartz for 300 feet north, and it was found to carry gold to the amount of \$3 to \$10 per ton, and only traces of silver. It is perfectly white, showing no trace of metal of any description.* The 1,200-foot level left the west wall at the incline, and was extended 230 feet eastward without meeting the east wall. The same 150 feet width of west quartz and porphyry, as in the upper level, was encountered; the clay division was here one foot thick; the identical 20 feet of white quartz with the same assay-value was found. Down to this depth the foot-wall has always kept its regular dip of 45° east, but below this point it fell to 35° east. At the 1,300-foot level the vein was followed throughout the company's ground, and connection made with Imperial on the north, and Belcher on the south. Cross-drifts east for 500 feet developed the same characteristics as the two upper levels. The white quartz widened to 30 feet in places

* Contrary to the fears expressed in my former reports, the influence of carbonate of lime has not proved hostile to the metalliferous and concentrated character of the ores. On the contrary, this body, for instance, seems to carry most metal in the portions in which this mineral abounds most largely.—R. W. R.

and ran out into stringers in the Eclipse ground; the assays of it remained the same as above. A trial was made of several tons, yielding \$7 per ton. This level, although tolerably well explored eastward, and not successful in finding pay-ore, and though it shows at 500 feet east from the incline what is called the east wall, has, nevertheless, probably not been driven far enough east.

The next or 1,400-foot level, shows the west wall still 35° east, but the western quartz-porphry stratum is only 50 feet wide. The white quartz east of it is 20 to 30 feet wide, and keeps its character, but does not contain as much gold as above. Explorations have gone, so far, 300 feet east and 225 feet north and south, but nothing of note has as yet been encountered. The lowest or 1,500-foot level still shows the west wall 35° east, the western quartz and porphyry only 14 feet thick, whilst the white gold-bearing quartz has always kept its distance from the incline the same as in the 1,100-foot level. This level just penetrated this quartz here and found considerable water, which retarded the work of prospecting for one month. No work north or south has been done here as yet. This mine has been worked very vigorously during the past year; 3,736 feet of drifts and 659 feet of winzes have been excavated, and the main incline was lowered 636 feet. The ore produced during the year came from the body enumerated as No. 4 above, between the 900 and 1,000 foot levels, showing signs of weakness below, and pinched where the west wall changed its dip. The product was 20,000 tons of \$26 mill-ore. There is very little ore left, and the mine produces none at present.

The Kentuck mine has overhauled its old works thoroughly during the year, and is not producing any more ore now. Prospecting is carried on in the 1,300-foot level eastward through the neighboring mines. There being only 96 feet of ground, the company awaits the results of the work done in the two adjoining mines. If successful in finding ore, it extracts through them, obviating the sinking of its own shaft.

The ore body of No. 9 was at first discovered in Crown Point 1,000-foot level, east and south of where the upper body trailed itself out in that large quartz-mass. The Crown Point has explored it to a depth of 400 feet, showing it to extend north of the south line of that company, in all, 360 feet. Its dimensions have been, on the 900-foot level, 90 feet long, greatest width 14 feet; on the 1,000-foot level, 200 feet long, greatest width 60 feet; on the 1,100-foot level, 285 feet long, greatest width 84 feet; on the 1,200-foot level, 350 feet long, greatest width 124 feet. These are the figures given by the company. The average value of the ores in Crown Point has been below that of the ores from Belcher.

The Belcher has attained a total depth of 1,299 feet, viz, 844 feet vertical, and 455 feet at 40° and 38° . Work was at first commenced through Crown Point on the 1,100-foot level, at the company's north line, and followed southward for 310 feet. The south end showed 10 feet, and the north end, at the line, 65 feet ore-width. Afterward, the 1,000-foot level was opened, also through Crown Point, and the ore and quartz followed for 300 feet north and south, showing ore 210 feet long; the quartz is 80 feet wide, showing ore in an east and west seam; the west seam is the best, and is 20 feet wide; the center, between the two, is composed of low-grade ores; the eastern seam is 10 feet wide, of good ore. The 1,200-foot level has followed the ore so far 90 feet south of the company's north line, showing 84 feet of quartz-width, the east boundary not being reached as yet. Going south here, it becomes narrower, turns more to the east, and has not been followed to its southern terminus, but to all appearances it will not go as far south as on the upper level. The ore

occurs here also in two seams, exposed 50 feet south of the company's line, where the west ore-seam is 28 feet wide, of excellent ore. Bounding it on the east are 30 feet of poor ore in spots; further east come 12 feet of good ore, and beyond this again 60 feet of quartzose material, followed on the east by another 14-inch ore-seam. Work is still advancing eastward, but no east wall has as yet been found.

On the 1,300-foot level a winze has been driven east from the 1,200 to the 1,300 foot level, 50 feet south of the Crown Point mine, landing in the 1,300-foot level, 70 feet south of the line. It shows 36 feet ore-width here, but 100 feet south of the line the ore is 28 feet wide, and not so good as farther north. The width and extent south has not yet been fully demonstrated. In fact, both companies, to all appearances, have stumbled into this ore-body, and are digging pell-mell to see which can produce the most in the shortest space of time. Belcher now produces nearly 500 tons of ore daily from it, and is making preparations to produce between 500 and 600. Former workings of this style on the Comstock have taught us what result to expect.

All these levels of Belcher show, so far, that the ore runs parallel with the west wall, and apparently the ore-strata incline southward; but the lower levels show a real widening of the ore and quartz northward. It shows itself in the upper levels in the shape of a ridge descending north and south at about the same angle, but its dimensions are so stupendous that the naturally occurring irregularities are apt to lead to an erroneous opinion as to its position and form; further explorations yet to be made southward will have to determine that. The matrix is quartz and limestone mixed. Porphyritic intrusions are not as frequent as they were in the other bodies, at least as far as the present stopes show; and where lime predominates, there occur the richest ores, carrying a high percentage of gold, the bullion ranging from .060 to .070 fine in this metal. From the explorations made up to date through the four levels described, there is certainly twice the amount of ore that has been already extracted yet standing in the mine, even allowing that the ore should incline northward, which is possibly or probably the case. South of the Belcher, several companies have been sinking shafts and exploring the upper grounds, but no new feature of note has been developed.

The Obermann Company has sunk a new shaft eastward from its old one, in order to prospect the eastern portion of the Comstock; the Caledonia Company has done the same. The Justis has again commenced operations in earnest.

Considering all, it must be said that to-day the Comstock looks more promising than one year ago. Beginning at the north and going south, there is hardly one important mine which has not developed within the last year quartz and ore-material in its lower levels. The vein has not that barren appearance which it had. It is true that only three new ore-bodies in depth have been developed; and these are not sufficiently explored to speculate upon their value. The other three new bodies can only be looked upon as the reward of a thorough system of prospecting, namely, the Crown Point and Belcher, Hale and Norcross second level, and Virginia Consolidated ore-bodies, which might have been met with a year ago. If thorough and judicious prospecting were more generally pursued, it would not fail to give positive results. There are mines in the Comstock which have deep shafts, (1,500 feet,) and yet have left the territory passed through very partially examined. The ores of the old bodies, which local circumstances have made valuable in the course of time, have kept many of the mining companies alive for years; but now, since these, with very few exceptions, are virtually exhausted,

attention must be paid to a thorough system of overhauling of all the ground already penetrated. I do not doubt, for instance, that the ground lying east between South Jacket and Chollar Potosi, 1,800 feet long, for a depth of 1,000 feet below the surface, contains valuable ores which have been passed by. Illustrations and analogies are not lacking. The Belvidere ore-body in Chollar, which has yielded nearly \$3,000,000, was passed by in 1869, the prospecting drift running within 10 feet of it. The finding of the Hale & Norcross second-level ore-body east was the result almost of accident. Work had been pushed past it, downward, and its existence was not suspected. The greatest body found on the Comstock (except those which cropped to the surface) was through exploring work south and east in Crown Point, when the 1,000-foot level had been pronounced a failure, and all hopes of finding ore abandoned. Even when the edge of the ore was encountered, it was not believed to be of any importance, and the main work was already in progress down along the vein. Without a doubt, this last-named body, being so large, will have, like the other bodies, many smaller parallel masses and tributaries, which it will take some time to thoroughly explore and extract, so that the mines through which this ore-mass courses may be expected to yield very handsomely for at least one to one and a half years to come.

The hypothesis that ore-bodies will occur and continue to occur in depth has been proven, so far, correct; but, contrary to all expectations, they have been found of much larger dimensions, and the ores more universally distributed than overhead. Above all, the admixture of limestone as matrix has not been detrimental, as it was supposed it might become.

The cost of the work of prospecting in depth is greatly diminished from what it was one year ago, through the use of compressed air as a motor. This was at first employed in the Yellow Jacket mine by leading the air from a Burleigh compressor 1,300 feet vertically downward, and through 800 feet of drifts and winzes, to drive a Burleigh drill in the sinking of a 200-foot winze, which fully demonstrated the practicability of this power.

The hoisting of ores through the inclines is now done by machinery separate from the other hoisting-gear; and much credit is due to Mr. H. Donnelly, foreman of the Yellow Jacket, for a simple invention, in the construction of an incline car for dumping its load alone.

A thorough system of natural ventilation is gradually being adopted and becoming universally understood, and is much facilitated by the desire to connect the different mines, which formerly the controlling mania for speculation prohibited. Mr. Luckhardt found, for instance, the temperature at 1,897 feet depth below the croppings in Hale & Norcross, and 1,400 feet deep in Yellow Jacket, not at all oppressive, certainly not exceeding 85° F. in the face of the drifts; while at places where air was only artificially introduced from the surface by blowers the temperature at 1,500 feet rose to 125° F.

Wood for fuel in the last year has become scarcer than it was, and much coal is now being used as an admixture, and found to be more economical than either used alone.

Yield of the Comstock mines.—The following is the yield of the leading mines, as given by the Virginia Enterprise, from the assessor's returns. The average per ton is that of the last quarter only.

Yield of the Comstock Mines.

	Tons.	Value.	Average per ton.
Belcher	83, 194	\$4, 794, 669	\$65 00
Crown Point	110, 762	4, 598, 849	31 79
Chollar Potosi.	44, 350	752, 012	15 07
Empire	11, 248	177, 377	15 10
Hale & Norcross	38, 064	617, 325	17 64
Savage	53, 083	811, 867	14 03
Sierra Nevada.....	18, 380	122, 577	7 39
Woodville	650	10, 504	16 16
Kentuck	11, 183	141, 847	8 90
Challenge.....	380	1, 125	4 88
Total	371, 349	12, 028, 152	

To this amount should be added the product of the Yellow Jacket, estimated at \$520,000, and the amount produced from tailings, estimated (on the basis of the assessor's returns for nine months) at \$1,021,572, making a total of \$13,569,724. The mines and works of outlying districts, shipping through Virginia and Gold Hill, undoubtedly swelled this sum still further. Unfortunately, I have not at hand for comparison the express shipments from these two points alone.

THE SUTRO TUNNEL.

The Sutro Tunnel has passed the first stage—always tedious—of such works; that is, the establishment of the line, collection of machinery, construction of roads, and other preliminary labor. The surveyor is Mr. Schussler, and the work was done with an excellent transit instrument originally made for the city of San Francisco. Mr. Schussler is an engineer of that city, and a most competent man. The plan of the work includes a tunnel entrance at the town of Sutro, on the Carson River, and four shafts, which divide the work as follows:

	Feet.
From entrance to shaft No. 1.....	4, 915
From shaft No. 1 to No. 2	4, 150
From shaft No. 2 to No. 3	4, 480
From shaft No. 3 to No. 4.....	4, 150
From shaft No. 4 to Comstock lode	2, 450

In addition to these, there is an air-shaft completed 2,252 feet from the mouths and 500 feet deep. The total length of the tunnel will be 20,145 feet, and of the shafts, 4,910 feet. The latter, omitting the air-shaft, will have the following depths: No. 1, 523 feet; No. 2, 1,041 feet; No. 3, 1,361 feet; No. 4, 1,485 feet. The present condition of the work is as follows: In the tunnel the header had reached, November 30, 1872, a distance of 3,451 feet, and the enlargement is completed for 1,100 feet. Shaft No. 1 had been sunk 454 feet, with only 69 feet remaining unfinished. Shaft No. 2 was 623 feet deep, with 418 feet to go. Shaft No. 3 was sunk 377 feet, and had 984 feet left. Shaft No. 4 was 421 feet deep, and had still 1,064 feet to pass through. It will be seen that these shafts are in themselves no inconsiderable works. Shafts of 900 and 1,000 feet deep collect a pretty heavy amount of water, and the engines and

pumps which were at first put in were intended merely for a commencement, and at length failed to keep down the water.

In expectation of this, sixteen pumps had been ordered of Messrs. Allison & Bannan, of Pottsville, Pennsylvania. Each has a steam-cylinder of 22 by 72 inches, 10-inch water-cylinder, weighs 20,000 pounds, and raises 300 feet. These are the first direct-acting pumps of this capacity which have been placed in the West. As the tunnel will, of course, be the drain of nearly five miles of mountain, it will be certain to collect a great amount of water, and in estimating the amount the engineers thought that the Comstock lode itself offered the best criterion in forming an opinion. The quantity provided for at the shafts is, therefore, equal to the largest amount pumped from any one mine on that lode, namely, 20,000 gallons per hour. This is the capacity of the pumps at very moderate speed, and it can be increased by 50 per cent. It is not, however, thought that the water will ever amount to 720,000 gallons per day.

The amount of water actually pumped from the shafts during the past year was as follows:

Month.	Shaft No. 1.	Shaft No. 2.	Shaft No. 3.	Shaft No. 4.
January	Not measured.	Not measured.	Not measured.	Not measured.
February	58,000	Not measured.	Not measured.	Not measured.
March	1,860,000	Not measured.	Not measured.	620,000
April	3,000,000	210,000	330,000	1,140,000
May	4,000,000	62,000	217,000	3,800,000
June	3,000,000	300,000	300,000	2,100,000
July	2,500,000	558,000	403,000	2,480,000
August	4,800,000	Not measured.	2,500,000	2,170,000
September	5,000,000	300,000	3,000,000	Not measured.
October	3,500,000	350,000	5,000,000	Not measured.
November	2,800,000	2,000,000	4,500,000	1,530,000
December	3,336,000	2,108,000	4,700,000	1,844,000
	33,854,000	5,898,000	20,950,000	15,684,000

Taking December as an average, we have 387,000 gallons a day. The cutting through of shaft No. 1 will, of course, remove the necessity of pumps at that station.

The quantity, however, is certain to be vast, and provision has been made for utilizing it in the operations of the tunnel. The water pumped from shaft No. 3, and probably also that from No. 4, (which latter, however, will have to be pumped an additional height of about 150 feet,) will be conveyed by its natural flow to the divide between shafts Nos. 1 and 2, which has an elevation above the tunnel-level of 1,350 feet, whence it will be conveyed in pipes to the face of the tunnel; the pressure obtained will be 675 pounds to the square inch, which will give a large power. The quantity of water will be largely increased by the construction of dams and reservoirs in the ravines adjacent to the flume which conveys the water from shaft No. 3 to the divide, and in which will be stored up the rain-water accumulating during the winter-months and that from melting snow, which falls to considerable depths in some of the deep gorges, and does not altogether disappear until the month of June. The completion of the tunnel will, of course, remove the supply from the pumps, while that obtained from the reservoirs will be permanent. To this will, at a future day, be added the water flowing from

some remarkable springs situated at an elevation of about 1,000 feet above the tunnel-level, at a distance of about five miles to the northward, which are estimated to supply from nine to twelve miners' inches. One of the dams spoken of above has been completed, and a pipe carried to and down the air-shaft a distance altogether of about a mile, with a fall of 500 feet.

The whole work in the tunnel has, so far, been carried on by hand. One holder and two strikers are employed at each drill. Two holes are drilled from two to five feet deep, according to the nature of the rock, into each of which a cartridge of dynamite, or "giant powder," is inserted. The cartridges are then exploded simultaneously by means of fuses and caps. This explosion makes an opening of considerable size at the bottom of the drill-hole, which is then filled with ordinary black powder. This is fired off with a water-proof fuse, the men in each case retreating from 200 to 300 feet distant from the header until the explosion takes place. Mules have lately been used to run the cars out, and mining-locomotives will soon be put on.

The alternations of rock encountered were as follows: From the mouth of the tunnel a belt of conglomerate, consisting of boulders of trachyte cemented together with volcanic tufa, extends for a distance of 650 feet; this is succeeded by a formation of coarse trachyte about 530 feet wide; then follows a seam of red clay 35 feet in width; following this is a belt of blue clay 150 feet, succeeded by porphyry or greenstone, of varying hardness, 175 feet wide. A narrow seam of trachyte was then met, which was succeeded by propylite, extending to a distance of 3,000 feet from the mouth of the tunnel; here trachyte was struck again, in which rock the work was, November 30, 1872, 3,455 feet from the entrance. Shafts Nos. 1 and 2 are sunk in trachyte; Nos. 3 and 4 in propylite. The full size of the tunnel, as far as completed, is 12 by 16 outside of the timbers, which are 10 by 12 inches, except the inside posts, which are 10 inches square. This is divided into two compartments, each $5\frac{1}{2}$ feet wide at the bottom, $4\frac{1}{2}$ at the top, and 10 feet high, with a passage-way between and a drain underneath. The top and sides are covered with "lagging," or sheathing, of 2-inch plank. This timbering is to be permanent, but it is proposed to adopt a different style for the remainder of the tunnel, where the arch-form will be used. In the clay ground a brick arch will be necessary.

The four shafts are of the same size, viz, 5 by 10 feet, divided into two compartments, one 5 by 5 feet, the other 4 feet 2 inches by 5 feet. One division is used for hoisting rock, which is raised by means of a large wrought-iron tub attached to a flat wire cable, operated by a large steam-engine at the surface. The workmen also use this shaft. The other compartment is for pumps and air-pipes. It also contains ladders, each 15 feet long, and resting on a platform 5 feet by 20 inches. It is proposed to replace the hoisting-tubs by cages, on which cars can be run and hoisted to the surface. The shafts are timbered with sets of timbers placed 5 feet from centers, the outside pieces 10 by 12 inches; the posts 10 by 10 inches; the inside girths 10 by 14 inches. The "lagging" or sheathing around the outside of timbers is of 2-inch plank; the lining is 1-inch boards.

The tunnel-water is to be used as a source of power, and the plan of the town of Sutro contains some noticeable features; but these and other points not immediately connected with the work of the tunnel we must pass over.

The great question in regard to this, as to every engineering work of the kind, is, How soon will it be finished? The projector of the enterprise is happily able to give a favorable answer to this. Lying as it does under ranges of comparatively low hills, the work can be reached by shafts, and its completion hastened with ninefold rapidity. From the day the last shaft has reached the tunnel-level there will remain the time necessary to penetrate 2,450 feet of rock, and then the work will be finished. The coming of that day is to be hastened by the use of diamond or Burleigh drills, whichever shall be found best suited to the hard rock in which the Comstock is imbedded.

The shafts are to be sunk by the system of continuous drilling, which General Pleasants has introduced with such success in Pennsylvania. It is a question whether this method will succeed in a homogeneous, tough rock, like propylite, as well as it does in the stratified deposits of the coal-regions. It does not seem to us that the chance of failure is very great, and in any event the use of the diamond drill, in one way or another, will certainly hasten the work. In the shafts, diamond drills alone are to be used, but in the tunnel, trial will be made of the Burleigh drills, as before stated. The motive-power of the drills will be the water brought, as above mentioned, from the auxiliary shafts. This will be conveyed to the heading, where hurdy-gurdy wheels will be placed. This system is preferred to the transmission of force by compressed air, on account of the loss of power by the latter.

It is expected that these improvements will permit a progress of three feet in twenty-four hours in the shafts, so that the deepest of them will be completed by midsummer of 1874. Mr. Sutro calculates that if the diamond or percussion drills do as good work in propylite as the latter did on the less favorable rocks of Mount Cenis, the lode will be reached within thirty months from January 1, 1873.

The progress thus far made appears to be decidedly creditable to the projector and engineers of the work. The organization of the office seems efficient, and the work has progressed so far with few delays. In fact the progress made is very flattering, and if the coming work answers the expectations formed of it, we shall have had in this country one example, at least, of a well-conducted great mining enterprise on the largest scale.

Report of the Gould & Curry for the year ending November 30, 1872.

The superintendent reports no ore extracted during the year. Prospecting has been vigorously prosecuted, 298 feet of shaft and incline having been sunk, and an aggregate of 4,100 feet of drift made, as follows:

	<i>Feet.</i>		<i>Feet.</i>
Fourth station	684	Eighth station	1,453
Fifth station	390	Tenth station	1,002
Seventh station	477	Eleventh station	97

In addition thereto, 360 feet of old drifts have been re-opened and re-timbered.

So far all this work has not succeeded in discovering a new ore-body. A new and powerful engine has been added to the six already at the works. All the machinery is in good order, with the exception of the boilers, which are insufficient and need replacing.

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The secretary's report furnishes the following data:

RECEIPTS.

Cash on hand December 1, 1871.....	\$43,267 38
Assessments Nos. 12 to 15, inclusive.....	321,966 00
Mine account	11,368 95
Real estate.....	25 00
Mill account.....	2,017 20
Total.....	378,644 53

DISBURSEMENTS.

Mine account.....	\$311,140 67
Interest	315 71
Mill account.....	75 20
Adverse claims and legal expenses.....	5,564 95
Exchange	1,641 00
Taxes	2,471 15
General expenses	21,587 02
Cash on hand November 30, 1872.....	35,848 83
Total.....	378,644 53

Total assets.....	\$150,947 37
Total liabilities.....	705 50

Report of the Savage for the year ending July 10, 1872.

[Extract from superintendent's report.]

The mine has yielded during the twelve months ending June 30, 1872, 47,505¹/₂ ~~888~~ tons* of ore, taken from the following sections of the new and old mines:

NEW MINE.

	Tons.	lbs.
First level south.....	500	550
Second level north.....	10,334	1,400
Second level south.....	2,591	1,630
Third level north	4,579	280
Third level south.....	1,695	1,220
Fourth level north.....	848	310
Fourth level south.....	3,745	960
Ninth level south	1,768	560
Tenth level south.....	3,029	1,050
Eleventh level south.....	5,502	950
Twelfth level south.....	336	500
Total.....	34,931	1,410

* During the rest of the year, 1872, the Savage mine has produced ore as follows:

	Tons.	lbs.
July.....	5,128	600
August.....	5,200	1,000
September.....	5,231	1,250
October.....	3,917	.....
November.....	3,912	400
December.....	4,103	1,400
Total.....	27,493	650

This ore is from the north second and third, the south eleventh and twelfth, and the old third and sixth levels. The ore ran from \$21 to \$38 per ton.

OLD MINE.

	Tons.	lbs.
Second level.....	959	770
Fourth level.....	569	1,150
Fifth level.....	1,711	1,250
Sixth level.....	9,333	1,080
Total.....	12,574	4,250

A fair quantity of ore has been extracted, amounting to nearly 4,000 tons per month on the average, but it has been of so low a grade as to be far from remunerative. It has yielded \$18.70 per ton, which falls short of the cost of production and of reduction by the sum of \$3.25 per ton. The cost of production, in which care has been taken to include with labor and materials every item of incidental expense, has been \$10.15 per ton, and the cost of reduction has been \$11.80 per ton, making the whole expense incurred, until the ore has become beneficiated, \$21.95 per ton, which is 29 cents less to the ton than the average cost for the five preceding years. This loss, then, from the last year's operations, is due to the diminished yield of the ore and not to any increase in the aggregate of the cost of production and reduction.

On the eleventh level, connection has been made with the Hale & Norcross mine, which establishes a free circulation of air. Ore has been found here in places. On the twelfth, or lowest level, a drift has been run southerly, about half way to the south line, and from this a cross-cut to the east, reaching vein-matter. Progress here has so far been slow on account of the hot air.

At the present time the resources of the mine for ore are limited to the second level north, third level north, eleventh and twelfth levels south, and the third and sixth levels of the old mine. Work on all the other levels has been suspended, as they are exhausted of all ore considered worth taking out. The levels above named are now yielding in the aggregate about 170 tons daily, and the assay value of the ore taken from them in the month of June will fairly represent the value of the ore now in sight. These values, per ton, are respectively as follows: Second level north, \$19; third level north, \$18; eleventh level south, \$24; twelfth level south, \$31; and the third and sixth levels, old mine, \$36. From present appearances, the second and third levels north, and the sixth level, old mine, will continue to yield, for many months, ore of the quality above indicated.

The total quantity of ore reduced in the past year was 48,392 $\frac{1700}{2000}$ tons, all at custom mills, excepting about 1,100 tons, which was reduced at the company's mill (Savage mill) at Washoe, in the months of July and August.

Condensed statement of the production and expenses of the Savage Mining Company for the year ending June 30, 1872.

	Tons.	lbs.	Tons.	lbs.
Ore on hand July 1, 1871, at mills.....	968	130		
Ore on hand July 1, 1871, at mine.....	214	...		
	—	—	1,182	130
Ore produced			47,505	1,660
Total			48,687	1,790
	Tons.	lbs.	Tons.	lbs.
Ore reduced at Savage mill.....	1,095	1,080		
Ore reduced at custom mills	47,297	710		
	—	—	48,392	1,790
Ore on hand July 1, 1872, at mine.....			295	
Total			48,687	1,790

PRODUCT.

Bullion.....	\$883,192 72
Deduct bullion from 109 $\frac{2330}{2000}$ tons Belcher ore reduced, intermixed with Savage ore	6,095 32
Total bullion from 48,392 $\frac{1700}{2000}$ tons ore reduced (Savage ore)	877,097 40
Add reclamations received from mills—cash.....	28,197 69
Total product of 48,392 $\frac{1700}{2000}$ tons ore.....	905,295 09

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Cash, from materials sold.....	\$116 76	
Sundries.....	456 50	
		\$573 26
Total product.....		905,868 35

EXPENSE.

Cost of production of ore, 47,505 $\frac{1660}{2000}$ tons—		
Mine cost, labor.....	\$307,232 46	
Materials.....	150,598 31	
		\$457,830 77
Assaying bullion.....	1,785 67	
Assaying ore.....	3,741 12	
Other incidental expenses.....	18,827 73	
		\$482,185 29
Cost of reduction of ore, 48,392 $\frac{1700}{2000}$ tons.....	571,252 05	
		\$1,053,437 34
Total loss.....		147,568 99

Average yield of the ore reduced, including reclamations, per ton..... \$18 70

Cost of production, per ton—

Mine cost—labor, \$6 47; materials, \$3 17.....	\$9 64
Assaying bullion.....	0 03 $\frac{8}{10}$
Assaying ore.....	0 07 $\frac{3}{10}$
Other incidental expenses.....	0 39 $\frac{3}{10}$

Total cost per ton.....	\$10 15
Cost of reduction at Savage mill, net cost.....	\$9 94
Cost of reduction at custom mills.....	11 85
Average cost of reduction.....	11 80
	21 95

Average loss from the ore produced, per ton..... 3 25

Average assay value of the ore reduced, per wagon-samples, per ton, \$30 16.

Average yield of the ore reduced, in bullion, per cent. of assay value, 60.1.

Average yield of the ore reduced, in bullion, including reclamations, per cent. of assay value, 62.

	Gold. Silver.	
Proportions of gold and silver in the ore.....	28.3	71.7
Proportions of gold and silver in the bullion.....	32.2	67.8
Percentage returned of the gold and silver contained in the ore.....	68.3	56.9
Average value of the bullion, per ounce, after melting, \$1,85 $\frac{8}{10}$.		
Average loss of weight in melting, 3 per cent.		

Comparative statement.

For year ending June 30.	Ore produced (not including ore extracted from old mine on con't s'ld.)		Ore reduced.		Cost of produc- tion.	Cost of reduc- tion.	Total cost.	Yield of ore re- duced.	Profit.	Loss.	Proportions of gold and silver in the ore. Third class.			
											Per wagon- samples.		Per mill- samples.	
	Tons.	Pounds.	Tons.	Pounds.	Per ton.	Per ton.	Per ton.	Per ton.	Per ton.	Per ton.	Gold.	Silver.	Gold.	Silver.
1867	70,721	620	69,376	1,340	\$7 91	\$14 04	\$21 95	\$41 94	\$19 93				26.9	73.1
1868	83,444	1,250	84,626	1,670	7 21	13 74	20 95	40 84	19 89		27.9	72.1	28.8	71.2
1869	53,953	1,350	55,479	760	8 90	12 22	21 12	34 87	13 75		25.1	74.9	26.4	73.6
1870	14,051	500	13,272	600	26 87	10 01	36 88	20 67		\$16 21	27	73	27.1	72.9
1871	39,715	150	38,147	290	11 06	9 95	21 01	21 43	42		27.8	72.2		
1872	47,505	1,660	48,392	1,790	10 15	11 80	21 95	18 70		3 25	28.3	71.7		

The secretary's report gives the following receipts and disbursements:

RECEIPTS.

Cash.....	Balance on hand July 10, 1871	\$18,299 81
Bullion.....	Bars received from mine . \$883,192 72	
	Reclamations from mills . 28,197 69	
	911,390 41	
	Less amount returned to Belcher Company..... 6,095 32	
		905,295 09
Virginia & Truckee R. R. Co.	Return-freights on account.....	12,367 69
Rent	House-rent.....	35 00
Cash.....	Balance overdrawn.....	133,708 50
Total		1,069,706 12

DISBURSEMENTS.

Surveying	In mine	\$9 00
Fuel	Wood and charcoal.....	44,970 92
Freight	On mining-materials to Virginia.....	3,568 29
Freight on bullion	Per Wells, Fargo & Co.'s Express.....	2,173 36
Assay-office.....	Net cost of company's office.....	4,917 87
Interest	On overdrafts at bank	3,080 90
Legal expense	Attorney's fees, &c.....	2,440 00
Mill-material and labor	Cost of reduction of ores at company's mill	8,225 50
Reduction of ores.....	Paid custom mills	560,361 60
Incidental	Sundry extraordinary expenses.....	1,486 28
Horse-keeping	Feed, vehicles, and repairs.....	1,831 17
Assaying	Paid for outside work	9 00
Water.....	Virginia and Gold Hill Company	9,600 00
Expense.....	Office-rent, porter, &c.....	2,899 48
Books and stationery.....	For Virginia and San Francisco offices.....	1,133 96
Exchange.....	On superintendent's drafts	2,684 69
Labor	Miners, engineers, &c., and company offices.....	313,232 46
Timber and lumber		46,557 04
Taxes and stamps	Federal, State, county, and city taxes ..	9,344 92
Materials.....	Mining-supplies, hardware, candles, oil, &c., and insurance on hoisting-works.....	48,179 10
Discount	On bullion.....	2,005 58
Real estate.....	City lot at Virginia, recording, &c.....	104 00
Total		1,069,706 12

Report of the Hale & Norcross mine for the year ending March 1, 1873.

The superintendent reports that during the past year 39,272½ tons of ore have been extracted from the various levels of the mine; and 40,417⁶⁸⁰/₂₄₀₀ tons been reduced. Bullion to the amount of \$657,950.37 has been produced from this quantity of ore, and there are now remaining on hand in the ore-houses 2,010¹⁸⁰/₂₀₀₀ tons, valued by assay at \$63,418.40. Within this period the sinking of the main incline was energetically continued until it had attained a length of 773 feet below the eighth level, or bottom of the perpendicular shaft. The ninth and tenth levels were also opened, and have been partially explored; the yield from the several stopes in this section already aggregating 14,859½ tons.

At the next station below (the eleventh) no excavation has yet been made; but at a point 100 feet below it, the twelfth-level station has been opened out. From this incline station a drift has been run in the west wall of the vein northward, to within 70 feet of the northern boundary.

On the 800-foot level a new ore-body has been discovered, lying 70 feet east of the old ore-body, formerly worked in this level. It was first encountered 130 feet distant from the southern boundary-line, and explored up to the latter, where it is very large and richer than before. The average width of the ore exposed is 45 feet.

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From the secretary's report I take the following :

RECEIPTS.

Amount forward from February, 1872	\$10,484 32
From sundry sources	12,420 51
Assessments Nos. 37-39, inclusively	240,000 09
From ores worked	657,950 37
From bullion received on account of February (1873) workings	53,114 24
Total	973,969 44

DISBURSEMENTS.

Amount of bullion received on account of February (1872) workings, charged cash in last annual statement, and credited on account as portion of this year's receipts	\$37,359 74
Tax account	4,321 58
Machinery account	13,706 77
Team account	2,956 56
Assay-office account	6,481 01
Mine account	358,111 44
General-expense account	47,081 54
Ore account (working 40,417 ⁶⁸⁰ / ₂₀₀₀ tons)	462,650 73
J. G. Fair, superintendent, amount of his book-account	2,896 91
	935,566 28
Cash on hand per cash-book to balance	38,403 16
Total	973,969 44

PRODUCT.

			Tons.	Pounds.
1872—February 1st—On hand			3,154	1,860
Extracted.	Tons.	Pounds.		
From 175-foot level	491	1,000		
From 500-foot level	2,263			
From 535-foot level	791			
First-station level	9,161	500		
Second-station level	11,672	1,500		
Third-station level	33	1,500		
Ninth-station level	14,859	500	39,272	1,000
Reduced.			42,427	860
First quarter	10,894	560		
Second quarter	9,663	1,910		
Third quarter	8,702	230		
Fourth quarter	11,156	1,980	40,417	680
On hand, February 1, 1873			2,010	180

The following table of the proportion of the precious metals in the ore, assay values, actual yield, and loss, is interesting :

Period.	Proportion of metals in the ore.	Assay values.				Yield.			Loss.		
		Quantities.		Per ton.	Amount.	Per ton.	Per cent. of assay value.	Amount of bullion.	Per ton.	Per cent.	Amount.
		Tons.	Lbs.								
Quarter ending April 30, 1872		10,894	560	87 52	\$81,989 64	\$4 91	.65	\$53,549 79	\$2 61	.35	\$28,439 85
Gold	.30										
Silver	.70			17 72	193,046 58	11 68	.66	127,259 67	6 04	.34	65,786 91
Ore				25 24	275,036 22	16 59	.65	180,809 46	8 65	.35	94,226 76
Quarter ending July 31, 1872		9,663	1,910	5 46	52,814 53	4 08	.74	39,448 00	1 38	.26	13,366 53
Gold	.30										
Silver	.70			12 84	124,132 29	8 27	.64	79,960 25	4 57	.36	44,172 04
Ore				18 30	176,946 82	12 35	.67	119,408 25	5 95	.33	57,538 57
Quarter ending October 31, 1872		8,702	230	9 17	79,853 04	6 56	.71	57,072 32	2 61	.29	22,780 72
Gold	.32										
Silver	.68			19 25	167,545 94	12 07	.62	105,067 56	7 18	.38	62,478 38
Ore				28 42	247,398 98	18 63	.65	162,139 88	9 79	.35	85,259 10
Quarter ending January 31, 1873		11,156	1,980	8 32	92,858 51	6 15	.74	68,682 79	2 17	.26	24,175 72
Gold	.31										
Silver	.69			17 98	200,659 25	11 38	.63	126,909 99	6 60	.37	73,749 26
Ore				26 30	293,517 76	17 53	.66	195,592 78	8 77	.34	97,924 98
Year ending January 31, 1873		40,417	680	7 61	307,515 72	5 41	.71	218,752 90	2 20	.29	88,762 82
Gold	.31										
Silver	.69			16 95	685,384 06	10 87	.64	439,197 47	6 08	.36	246,186 59
Ore				24 56	992,899 78	16 28	.66	657,950 37	8 28	.34	334,949 41
Seven years ending January 31, 1873		270,962	1,500	12 44	3,370,440 18	9 54	.76	2,585,214 01	2 90	.24	785,226 17
Gold	.31										
Silver	.69			26 99	7,314,631 66	16 30	.60	4,416,575 98	10 69	.40	2,898,055 68
Ore				39 43	10,685,071 84	25 84	.654	7,001,789 99	13 59	.34½	3,683,281 85

The quantity of ore reduced during the year compares as follows with previous years:

	Reduced.	Average.	Bullion.
1867, tons.....	28, 636	\$47 32	\$1, 355, 220
1868, tons.....	25, 333	34 14	864, 998
1869, tons.....	16, 536	23 89	395, 146
1870, tons.....	45, 441	27 13	1, 232 929
1871, tons.....	64, 974	25 13	1, 632 844
1872, tons.....	49, 625	17 38	862, 701
1873, tons.....	40, 417	16 28	657, 950

During the past seven years this mine has turned out and reduced 270,962 tons of ore, varying in value from \$47.32 to \$16.28 per ton. The total out-turn of bullion during this period has been \$7,001,789, of which \$4,416,575 was in silver and the remainder in gold. From this large sum of \$7,000,000, stockholders ought to have realized something handsome. Only \$1,598,000 has, however, been paid in dividends, while of this amount the company have compelled stockholders to contribute \$1,050,000 in assessments. The case may be stated thus:

RECEIPTS.

Bullion-product for seven years	\$7, 001, 789
Assessments seven years	1, 050, 000
Total.....	8, 051, 789

DISBURSEMENTS.

Dividends seven years.....	\$1, 598, 000
Expenses seven years.....	6, 400, 675
Cash, February 28, 1873.....	53, 114
Total.....	8, 051, 789

Deducting the assessments paid from the dividends received, we find the net profits to stockholders to have been \$548,000, or a trifle over \$78,000 per annum, on an annual bullion-product of \$1,000,000. Allowing the average capital employed to be \$1,000,000, the returns to stockholders show a small rate of interest. On the 40,417 tons ore mined and reduced last year, yielding \$657,950, the sum of \$358,111 was paid for getting the ore to the mills and \$462,651 for reducing the ore to bullion; in other words, \$850,762 was paid to mine and mill a product of \$657,950. It is evident, therefore, that the mine has been managed not so much in the interest of the stockholders as in that of the mills which have crushed the ore.

Report of the Chollar Potosi for the year ending May 31, 1872.

[Extract from superintendent's report.]

Ore extracted.....	37, 789½ tons.
Ore milled.....	35, 930 tons.
Average yield per ton.....	\$26 17
Gross yield of bullion	\$940, 119 60

The ore mined was obtained from—

	Tons.
Blue Wing	10,789
Belvidere	20,000½
Piute Station	7,000
Total	37,789½

Condensed statement of cost, production, &c., from June 1, 1871, to May 31, 1872.

ORE-STATEMENT.

Period.	Tons.	Pounds.	Tons.	Pounds.	Tons.	Pounds.
Ore on hand June 1, 1871.....	906	1,110	.....	.....	.....	.....
Ore extracted during year.....	37,789	1,020	38,696	130	.....	.....
Ore worked during year.....	.....	.....	35,930	.....	.....	.....
Ore on hand June 1, 1872.....	.....	.....	.....	.....	2,766	130

COST PER TON.

Extracting ore	\$2 38
Repairs, prospecting, dead work, and incidentals.....	4 19
	\$6 57
Reduction, including melting and assaying	12 16
Total cost per ton	\$18 73
Average yield of ore worked	26 17
Average net yield of ore worked	7 44

BULLION.

	Gold.	Silver.	Total.
Average value of bullion per ounce.....	\$. 092½	\$1. 22½	\$2. 15
Average fineness of bullion per ounce.....	.045	.950	.995
Average proportion of precious metals.....	.43	.57	1.00

WORK OF ASSAY-OFFICE.

Ounces of bullion assayed before melting.....	446,889.35
Ounces of bullion assayed after melting	436,602.85
Average loss in melting, per cent.....	2.3
Number of ore-assays made	9,541
Number of bars made	313

RECEIPTS AND EXPENSES.

Received from bullion.....	\$940,119 60	.....	.....
Received from other sources	4,304 52	.....	.....
	\$944,424 12		
Expenses by all sources.....	673,250 45		
Net receipts for year			\$271,173 67

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The secretary's report, contains the following receipts and disbursements:

RECEIPTS.

Bullion-account :		
Proceeds of bullion sold	\$940,119 60	
Reclamation on mills.....	2,200 00	
		<u>\$942,319 60</u>
Sundries :		
Received from sale of wagon, harness, &c.....	415 60	
Received rent from Breed & Crosby.....	40 00	
Received from sale of machinery to Buckeye Company....	1,238 75	
Received from sale of lot at Virginia.....	200 00	
Sundry materials during year	160 17	
		<u>2,054 52</u>
Book-accounts :		
Amount received for account of sundries.....		39 00
Cash-account :		
Cash on hand, as per last statement.....		200,721 32
		<u>1,145,485 44</u>
Total.....		

DISBURSEMENTS.

Dividend-account :		
Paid dividend No. 37.....	\$56,000 00	
Paid dividend No. 38.....	28,000 00	
Paid dividend No. 39.....	28,000 00	
Paid dividend No. 40.....	28,000 00	
Paid dividend No. 41.....	28,000 00	
Paid dividend No. 42.....	28,000 00	
Paid dividend No. 43.....	28,000 00	
Paid dividend No. 44.....	28,000 00	
		<u>\$252,000 00</u>
Working-ores account :		
Expenditure for the year		431,160 00
Labor-account :		
Expenditure for the year.....		164,793 03
Timber and lumber account :		
Expenditure for the year		44,479 68
Taxes :		
State and Federal taxes		17,997 53
Hardware-account :		
Expenditure for the year.....		7,693 98
Water-account :		
Expenditure for the year.....		6,600 00
Wood-account :		
Expenditure for the year		3,581 00
Charcoal-account :		
Expenditure for the year		1,325 78
Candle-account :		
Expenditure for the year		3,132 05
Powder-account :		
Expenditure for the year		1,970 88
Discount-account :		
Paid on superintendent's draft.....	\$1,074 00	
Paid on bullion sold.....	777 58	
		<u>1,851 58</u>
Oil-account :		
Expenditure for the year		486 50
Assaying-account :		
Expenditure for the year.....		1,200 17
Stable-account :		
Expenditure for the year		2,690 22
Rent-account :		
Rent of San Francisco office.....		1,500 00

Legal-expense account:		
Expenditure for the year		\$8,699 50
Materials-account:		
Sundry purchases of materials		1,672 35
Stationery-account:		
Expenditure for the year		846 10
Telegraph-account:		
Expenditure for the year		222 01
Freight-account:		
Paid for carriage of bullion	\$3,504 14	
Paid for miscellaneous freight	465 69	
		3,969 83
Surveying-account:		
Expenditure for the year		950 00
Title-account:		
Purchase of Milton stock to perfect title		500 00
Real-estate account:		
Purchase of lots at Virginia		650 00
General-expense account:		
Incidental expenses of Virginia office during the year	\$4,676 68	
Incidental expenses of San Francisco office during the year ..	2,965 94	
Paid fire insurance on company's property at Virginia	1,181 35	
		8,823 97
Superintendent Requa:		
Due from him on superintendent's account	\$4,128 74	
Less last year's balance received	2,313 28	
		1,815 46
Book-account:		
Amount paid on this account		725 00
Cash-account:		
Cash on hand this day		174,148 82
Total		1,145,485 44

Report of the Crown Point for the year ending May 1, 1872.

[Extract from the secretary's report.]

The number of tons of ore extracted was 81,226, at an average cost of \$7.09, and 80,567 tons of ore were milled, at an average cost of \$11.43 per ton. The number of mills employed in crushing this ore was fifteen, including the Rhode Island mill belonging to the company. The average of this ore was \$43.48, and the total product amounted to the sum of \$3,503,633.

The following are the receipts and expenditures for the fiscal year:

RECEIPTS.	
From bullion	\$3,503,633
Miscellaneous sources	2,328
Total receipts	3,505,961
Cash on hand May 1, 1871	94,602
Total	3,600,563
EXPENDITURES.	
Mines, labor, and supplies	\$576,670
Mine improvements	65,331
Rhode Island mill, labor	109,331
Rhode Island mill, improvements	14,307
Crushing 67,220 tons ore	807,309
General expenses Gold Hill office, &c	36,360
Legal expenses	8,400
San Francisco office-expenses, &c	9,171
Discount	2,803
Interest	1,385

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Assaying.....		\$18,462
Taxes.....		18,454
Treasure freight.....		13,547
Real estate.....		468
Total expenditures.....		1,682,048
Cash, May 1, 1872.....	\$644,507	
Cash in hands of superintendent.....	14,008	
		658,515
Dividends to stockholders.....		1,260,000
Total.....		3,600,563

The difference between the total receipts and expenditures, during the year, leaves a surplus of \$1,823,913, of which \$1,260,000 has been disbursed as dividends and the remainder carried to the surplus fund, leaving \$644,507.09 cash on hand on the 1st of May. The assets of the company, including said cash, amount to \$895,903, and the liabilities are nominal. The mine has paid out as dividends a total of \$105 per share, or \$1,260,000. Of these dividends five were \$10 per share, two \$15, and one \$25. Since the 1st of May the largest dividend has been disbursed, viz, \$480,000, or \$40 per share.

The average yield of the ore for the year being \$43.48, the mining costing but \$7.09, the crushing \$11.43, and the general expenses on the number of tons crushed \$1.53, leaves a profit of \$23.05. The operations in the mine during the past month have been retarded by the water, and by an accident to the machinery. The capital stock of the company is now \$10,000,000 in 100,000 shares.

By the kindness of Mr. E. S. Davis, United States surveyor-general, I am enabled to publish the following table, which, although furnishing only a few points of comparison with the company's statement for their fiscal year, is very valuable in itself, in showing the comparative yield during the different months:

Bullion, ore, and labor for year ending July 1, 1872.

Month.	Tons of ore.	Number of men.	Product.
1871.			
July.....	6,986	305	\$199,376 30
August.....	4,949	308	161,290 62
September.....	5,306	279	165,898 14
October.....	4,366	288	141,695 59
November.....	6,788	278	234,797 84
December.....	6,674	339	223,129 56
1872.			
January.....	5,573	320	231,643 58
February.....	2,794	266	167,657 99
March.....	10,753	387	630,848 01
April.....	12,328	552	808,681 26
May.....	12,538	550	536,071 82
June.....	10,316	578	414,993 43
Total.....	69,371	.....	3,916,083 14

Average yield per ton, \$56.45.

Dividends during the above period, \$2,100,000.

Report of the Belcher for the year ending January 1, 1873.

In the superintendent's report occurs the following paragraph in regard to the resources of the mine :

Of the ore-bodies already developed, only approximate estimates could be made of their quantity or value. The reserves still above the 1,100-foot level are large, and from that level to the 1,300-foot level (on which the Crown Point—adjoining mine—have made large developments) has scarcely been touched, except what ore has been taken from the prospect-drifts and winzes. This gives an ore-body of over 300 feet in depth on the incline, which has uniformly given high assays. These facts will enable you to make approximate estimates of the quantity of these reserves already developed, and it may not be overestimating their value to take the past year's results as the best criterion to judge by.

In regard to the quantity of ore raised and work done the superintendent says :

Of the amount of ore extracted during the year, 72,595 tons came from the 1,100-foot level, 10,000 tons came from the 1,000-foot level, and 600 tons came from the 1,200-foot level.

A summary of the labor performed in the mine, during the year, shows the extracting of 83,195 tons of ore ; the running of 2,872 linear feet of drifts and winzes ; the sinking of 559 feet of the incline ; the retimbering of 257 feet of the main shaft ; the laying of 400 feet of car-track, and other general repairs in and about the mines.

The secretary's report contains the following statements :

RECEIPTS.

Bullion.....	\$4,794,659 10
Virginia and Truckee Railroad Company ..	5,230 38
Cash, January 1, 1872.....	712,945 08
	5,512,834 56

EXPENDITURES.

Labor-account.....	\$660,609 16
Crushing ore.....	998,341 38
Hoisting ore	83,633 75
Mine expenses, south	124,184 14
Mine expenses, north.....	61,458 14
Wood and coal	33,141 06
Timber and lumber.....	113,352 80
Assay-ore	3,517 13
Assay-bullion	11,571 83
Taxes, proceeds of mine	23,785 12
Taxes, State, city, and county.....	3,476 58
Exchange.....	6,994 48
Discount on bullion.....	46,222 57
General expense.....	6,284 61
Legal expense.....	10,250 00
Office expense.....	8,775 00
Treasure freight.....	17,412 07
Construction	21,782 36
Freight account.....	38,124 98
Salaries "Gold Hill"	8,750 00
Dividends Nos. 1 to 9, \$21 per share	2,184,000 00
Supplies	13,865 48
William H. Smith, cash on hand	12,177 81
Cash, January 1, 1873	1,011,124 11
	5,512,834 56

Cost of producing and reducing 85,195 tons of ore.

Labor	\$460,609 00
Hoisting.....	83,633 00
Supplies, hardware, tools, iron, &c	85,642 00
Timber	64,352 00

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Assays, ores, &c.....	\$3,517 00
General expenses.....	6,284 00
Freight—wood, timbers, and supplies.....	19,124 00
Wood and coal.....	13,885 00
Salaries and office expenses.....	17,525 00
	754,571 00

Equal per ton, \$9.07.

Cost of crushing.....	\$12 00
Cost of mining.....	9 07
Total.....	21 07

ORE STATEMENT.

Monthly account of ores reduced in 1872.

Month.	Tons.		Average per ton.
January.....	8,473½	\$426,127 51	\$50 29
February.....	5,504	290,396 57	52 76
March.....	6,721	354,825 98	52 79
April.....	7,542½	365,915 15	48 52
May.....	7,411	429,349 35	57 93
June.....	6,979	407,772 37	58 43
July.....	5,000	321,421 93	64 28
August.....	5,886	251,790 83	42 77
September.....	6,545	442,201 16	67 56
October.....	4,690	366,326 54	78 10
November.....	7,656	534,394 63	69 80
December.....	10,787	604,137 08	56 00
	83,195	4,794,659 10	57 63

Number of tons worked.....	83,195
Total receipts of bullion.....	\$4,794,659 10
Average yield per ton.....	57 63

BULLION STATEMENT.

Stamped value of bullion as per assay certificates.

Value in gold.....	\$3,087,948 56
Value in silver.....	1,706,710 54
Total.....	4,794,659 10
Number of ounces refined bullion.....	1,483,753
Average fineness in gold.....	101 thousandths.
Average fineness in silver.....	890 thousandths.
Value per ounce, gold.....	\$2 08
Value per ounce, silver.....	1 15
Value of bullion per ounce.....	3 23
Average value per ton in gold.....	\$37 12
Average value per ton in silver.....	20 51
Total value per ton.....	57 63

LANDER COUNTY.

Reese River district.—The Manhattan Silver-Mining Company has again been the principal producer of the district; but its operations have not been as profitable to the individual shareholders as in former years, as will appear from the following report of the board of trustees:

Report of the Manhattan Silver-Mining Company of Nevada for the year ending December 31, 1872.

STATEMENT OF EARNINGS.

Receipts:

From Oregon and North Star mines, 1,136 $\frac{1593}{2000}$ tons ore, producing.....	\$226,984 14
From Camargo and Whitlatch mines, 242 $\frac{495}{2000}$ tons ore, producing.....	28,969 51
From Isabella mine, 238 $\frac{1129}{2000}$ tons ore, producing.....	34,655 08
From Mohawk mine, 95 $\frac{1152}{2000}$ tons ore, producing.....	37,301 88
From Grove Tunnel, 28 $\frac{720}{2000}$ tons ore, producing.....	7,965 57
Profit on custom-ores, 3,284 $\frac{1993}{2000}$ tons ore.....	20,534 32
Sundry royalties.....	390 19
Sherman House sold.....	450 00
Roanoke reel and frame sold.....	500 00
Premium on bullion.....	10,905 44
Premium on drafts on New York.....	767 25
	369,423 38

Disbursements:

Mining expenses.....	\$188,843 80
Milling expenses.....	49,193 05
Mill repairs.....	12,335 57
General repairs.....	1,251 03
Freight of bullion to New York.....	20,836 67
Reclamations on bullion.....	15,150 52
Taxes.....	7,128 67
Interest.....	6,776 28
Fire-insurance.....	2,404 20
Discount on drafts on San Francisco.....	3,454 56
Expense-account.....	22,905 04
Quicksilver lost.....	2,755 00
Depreciation of stable stock.....	337 56
Sundry losses.....	338 08
	333,710 03
Earnings, coin.....	
	35,713 35

GENERAL ACCOUNT.

Dr.

Surplus January 1, 1872.....	\$126,951 12
Earnings in 1872.....	35,713 35
Indebtedness to individuals.....	65,276 96
Coin.....	227,941 43

Cr.

Dividend paid January, 1872.....	\$19,375 00
Re-invested in developments.....	52,364 75
Mill improvements.....	4,549 07
Hoisting-works improvements.....	1,602 10
Purchase of Dollarhide mine.....	\$3,559 09
Purchase of Grove Tunnel, one half interest.....	800 00
Purchase of Nevada Hotel building.....	500 00
Purchase of South America shaft.....	1,500 00
Purchase of Homestake mine.....	237 54
Purchase of Jones's shaft.....	150 00
Purchase of Homestead water-right.....	250 00
Purchase of High wood-ranch.....	100 00
Purchase of Croft wood-ranch.....	75 00
Lease of Diana mine.....	500 00
	7,671 63
Supplies on hand.....	112,109 70
Bullion on hand.....	14,803 94
Cash on hand.....	15,465 24
Coin.....	227,941 43

Statement of surplus December 31, 1872.

Supplies on hand.....	\$112,109 70
Bullion on hand.....	14,803 94
Cash on hand.....	15,465 24
	142,378 88
Less indebtedness to individuals	65,276 96
Surplus, coin value	77,101 92

New York, March 11, 1873.

H. AUGUSTUS TAYLOR, *President.*
JOSEPH LEE, *Treasurer.*

From a report on the property of the company, made by Mr. J. E. Clayton, early in January, 1873, I insert here the following extracts:

The mining-property on which the company commenced work in July, 1865, consisted of *four* claims only, viz, the Southern Light, 1,000 feet; North Star, 1,000 feet; Blue Ledge, 800 feet, and the Oregon, 1,000 feet, making in all 3,800 linear feet of mining-ground. During the progress of the work, since the above date, very extensive and valuable additions have been made to the property, in the discovery of numerous blind leads, made during the progress of under-ground explorations; by purchases of adjoining mines and lodes, made from the net earnings of the original claims; and by extensive improvements and enlargement of the reduction-works, the purchase of the exclusive right to use the Stetefeldt furnace for chloridizing ores in this district, the erection of hoisting and pumping machinery on a number of the most promising mines, and a thorough equipment of every department of the enterprise—all of which has been done and paid for out of the earnings, besides paying an original debt of \$180,000.

The company now owns, in this district, sixty-eight mining-claims, aggregating about 70,000 linear feet in length; one thoroughly-equipped 20-stamp mill, Stetefeldt furnace, amalgamating-machinery, retort, smelting and assay furnaces; one large general-business office, fully furnished with desks, safes, &c.; one engineer's office, with all necessary instruments for making surveys and drawings; one coal-house, with capacity of 35,000 bushels; one salt-house, with 450 tons capacity; two brick store-houses for supplies, lumber, &c.; one powder-house, two dwelling-houses, one wood-ranch, and a portable saw-mill, complete and in good order; one stable and hay-barn, sufficient for ten horses; also a large stock of supplies for every department of the business. On the mines there are now erected and in good running order ten hoisting and two pumping engines, aggregating 220-horse power; three 6-inch column Cornish pumps, one portable saw-mill for preparing mine-timbers, &c.

Of the company's mining-property nearly or quite one-half is, according to Mr. Clayton, covered by double locations. This will leave about 35,000 linear feet on the various lodes located and owned by the company. Even so large a deduction leaves the Manhattan Company in possession of the largest mining-property in Nevada.

Mr. Clayton gives the following description of the property:

1. The North Star lode is situated on the southerly slope of Lander Hill. The extent of the Manhattan claim on this lode is 1,000 linear feet, and is bounded by the Buel North Star on the northwest, and the Timoke ground on the southeast. The course of the lode is nearly northwest and southeast, and it dips to the northeast at angles varying from 25° to 40°.

Both the course and dip vary greatly from straight lines, owing to numerous breaks and slips of the country-rock. The thickness of the lode also varies greatly in different portions of the ground. In some portions it is "pinched" down to a thin seam of a few inches only, and in other portions expands to 2 feet or more in width, making an average thickness or width of 12 to 15 inches.

This has been one of the most productive lodes in the district, and has been worked to greater extent than any other. The explorations have extended from the surface or outcrop of the lode to a depth of about 500 feet vertically, and about 800 feet on the slope or dip of the lode. The first shaft sunk by the Manhattan Company cut the lode at a depth of 180 feet. Levels were then run on the lode, west 360 feet and east 230 feet. In the mean time the shaft was continued vertically. At a depth of 220 feet a cross-cut was run for the lode, cutting it at a point 120 feet northeasterly from the shaft. Levels were extended from the cross-cut, on the lode, east 400 feet and west 265 feet. The shaft was then driven down to a total depth of 330 feet. At a point 300 feet from the surface a second cross-cut was run northeasterly for the

lode, striking it at a point 320 feet from the shaft. Levels were run from this point as before, east 515 feet and west 520 feet, making the total length of this third level 1,035 feet. It may be inferred from this that the levels extend beyond the boundaries of the claim, but such is not the case. This is owing to the numerous crooks and faults on the line of the lode.

While the ground thus explored was being stoped out, a new shaft (called the Oregon shaft) was sunk on the Oregon lode 550 feet northeasterly from the North Star shaft. This new shaft cut the North Star lode at a vertical depth of 500 feet. Levels were then run, east 425 feet and west 310 feet. All these levels were connected by inclines on the dip of the lode, and a large amount of pay-ore has been stoped out east and west as far as the levels have been extended. The extent of the lode explored from the levels described is about 700 feet long from northwest to southeast by 600 feet on the dip of the lode, including the 500-foot level. There are some barren spots and low-grade vein-stuff that will not pay to stope out of this area, but there are several large blocks containing pay-ore between the third and fourth levels; but the best chutes of ore have been taken out so far as known.

The following statement will show the results obtained from the block of ground worked through the North Star shaft, as above described, from October, 1866, to December 31, 1871, and extending from the old surface-workings down to the 300-foot level, making a block of ground 400 feet deep by 700 feet long:

Whole number of tons worked, 5,130²³⁰₀₀₀.

Bullion produced.....	\$828,504 62
Total cost mining and milling.....	501,736 71

Net profit from North Star mine, above 300-foot level.....	326,767 91
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The vein continues below the 500-foot level as strong and rich as at any point above, and, as it shows every essential character of a true fissure-lode, there can be no doubt of its continuity and value. The vein is further proved on the east by the Timoke mine, and on the west by the Buel North Star, both of which have been very productive mines, so far as they have been worked. The Timoke has been worked down on the incline of the vein 350 feet deep, and the Buel North Star has been worked by the Pacific Company down on a line with the 500-foot level in the Manhattan Company's shaft.

2. The Oregon lode (1,000 feet) is nearly parallel in course and dip with the North Star, and is situated about 225 feet above it, (or northeast,) measured at right angles to the dip of the lode.

The surface portion of the lode has been worked by an incline, and levels from it, to a depth of 360 feet on the incline of the lode. The Oregon vertical shaft cut the vein at a depth of 240 feet below the surface, and at a depth of 290 feet a cross-cut was run northeasterly, which cut the lode again. At 340 feet deep a second cross-cut was run northeasterly cutting the vein again. From all these points levels have been run each way on the lode. Small portions of the lode have been stoped out from the lower levels. The remaining portions are virgin ground, and contain large quantities of rich ore. The average length of the lode, proven by these levels, is about 620 feet, and from the surface out-crop down the incline of the lode to the 340-foot level is about 700 feet.

The amount of ore taken out of the Oregon lode from the three levels run from the shaft and the small stopes made is 1,517 tons 1,118 pounds. The bullion-yield was \$473,560.11, giving an average value per ton of \$312.

3. The Blue lode lies under the Oregon, and about midway between it and the North Star. It is a small vein carrying some rich ore, but has not been explored sufficiently to prove its value. Next above the Oregon are three other veins that have been cut by the northeasterly cross-cut from the Oregon shaft on the 290-foot level, the Fortuna, the Black, and the Joe Lane. These lodes have not been followed far enough each way from the cross-cut to determine their extent and value, except the Black lode, which has been driven up on a short distance, and 187½ tons of rich ore taken out, which gave a yield of \$51,785.12 in bullion, or an average of \$270 per ton. A number of other small veins were cut by the cross-cut, all showing some ore.

The Southern Light, Savage, and Seymour mines are all on a large, strong vein that lies a short distance south of the North Star lode. This is generally called the Savage lode, and it belongs to the second system of veins, or those having a more westerly and easterly course and steeper dip. Its course is N. 54° W., and its dip 56° northeasterly. This is a strong and true fissure-vein, having an average width or thickness of 18 inches. The principal work has been done in the Savage mine.

The Seymour mine, lying west of it, had some good chloride-ore on the surface, but it has not been followed in depth.

4. The Southern Light, lying east of the Savage, has been worked down but a short distance, where a cross-course broke the lode, and it has not been recovered. This slip or fault has a course north and south, and dip of 40° W. Every vein on the south slope of Lander Hill has been faulted or slipped by this cross-break. An incline

was sunk on the Savage ground to a depth of 360 feet. This incline is 450 feet west of the Southern Light boundary, and all the ore taken out lay east of the incline and west of the slip. This block of ground was of triangular shape, and continued rich down to the slip above described. About 2,113 tons of good ore were taken out of this portion of the ground before it came into the possession of the Manhattan Company, the aggregate yield of which was \$270,000. There have been some attempts made to recover the lode east of the break, but so far without satisfactory results.

5. The Alida lode is an under-ground discovery made in a cross-cut south of the Southern Light. It is a large, strong lode, 1 to 4 feet thick, carrying streaks and chimneys of fair average ore; 103 tons worked gave, in bullion, \$20,714.63, or an average yield of \$200 per ton. This vein belongs to the same class as the Savage and Southern Light, and appears to be conformable to it in course and dip. Explorations are now in progress to get the lode east of the great line of fault.

The foregoing described lodes comprise only those that have been explored to a greater or less extent in the section across the rich belt from the Alida to the Black lode, above the Oregon mine. The whole distance has been cross-cut at points below the surface, varying in depth from 170 feet to 500 feet. All veins cut by these levels, and not known to crop to the surface, have been located by the Manhattan as "new discoveries."

6. Those cut in the cross-levels run from the Oregon shaft are as follows: 1st. On the 170-foot level, the Blind lode, 65 feet north of the shaft; 2d, the Miantonomah, 186 feet from the shaft; 3d, the Stetefeldt, 256 feet from the shaft; 4th, the Frost, 314 feet from the shaft; 5th, the Huber, 384 feet from the shaft; 6th, the Alliance, 411 feet; 7th, the Lee, 453 feet; 8th, the Farrell, 516 feet from the shaft. This 170-foot cross-cut northeasterly has been extended 560 feet. Of the eight lodes cut by this cross-level there are three that have been followed by levels each way, viz, the Blind, Frost, and Alliance lodes, and the work on them is still progressing with satisfactory results.

7. South of the Oregon shaft the Curtis, Antarctic, Pacific, Hiko, Research, Alsop and Ruby lodes have been cut, making a total of fifteen blind lodes discovered by underground cross-cutting.

The Manhattan Company owns another set of claims northwest of those above mentioned, and in the same rich silver zone of country. The most prominent of these are the Isabella, Dollarhide, Mohawk, Graham and Ashley, and O'Connell lodes. Of this northwesterly group the explorations are now in progress, and very rich ores are being extracted.

1. The Isabella is a well-defined and promising vein, carrying high-grade ore. An incline 200 feet deep, and levels run each way, have proved the character and value of the mine; 704½ tons of ore have been extracted and reduced in the Manhattan mill that gave a product, in bullion, of \$147,357.96, or about \$209 per ton of 2,000 pounds.

2. The Dollarhide is a westerly extension of the Revenue. This is a small vein of very rich ore; it will probably average about 8 inches in thickness. An incline is now down 280 feet on the lode, and levels are being driven on the vein. Seventy and a half tons of ore worked from this mine gave a yield, in bullion, of \$22,412.44, or an average of about \$315 per ton.

3. The Ogden incline is on the O'Connell lode, and is now down 400 feet. It strikes the dip of the lode at 240 feet from the surface, and then follows the vein. This is a well-defined vein of 12 to 18 inches, and, from its general appearance, is supposed to be a westerly portion of the Black lode. The ore is high grade, but has not yet been milled.

4. The Graham and Ashley has an incline down 300 feet on a good vein 8 to 10 inches thick, of high-grade ore. One hundred and sixty-six and a half tons of ore from this mine gave, in bullion, \$37,482.18, or \$224 per ton.

5. The Mohawk lode has an incline down on the dip of the lode 460 feet. The vein is from 4 to 16 inches thick, and carries exceedingly rich ores. Three hundred and fifty tons of ore extracted from the incline and levels from it have been milled, giving a yield per ton of \$435, or a total yield of \$152,282.89. The net profits from this small lot were \$62,861.06. The ore in the westerly stopes and in the bottom of the incline holds equally good as that already stoped out.

In addition to the mines described, the company owns a group of mines near the head of Marshal Cañon, about one mile south of the Lander-Hill group, and on the south slope of Union Hill. The principal mines of this group are the Congress Independent, Whitlatch Union and Camargo. The explorations on this group are not extensive. Most of the work has been done on the Whitlatch Union and Camargo. The vein is one of the largest and most promising in the district. It is from 1 to 5 feet thick, and has produced a large amount of good ore near the surface, but, as most of it was taken out before it came into the possession of the Manhattan Company, I have no authentic data of the earlier workings. There have been extensive faults and slips in this great lode, and the original owners lost it entirely. Since the Manhattan Company has owned the property a systematic exploration of the ground has been com-

menced. During the progress of the present work several blocks or detached portions of the lode have been found, and 261 tons of ore taken out, giving a yield of \$32,670.23, or about \$125 per ton. There can be no question about finding this lode below the surface breaks; it is only a question of time and labor. It will probably be found within a short distance east of the present workings. The character of the ground and the form of the hill would seem to indicate that most of the broken country has been passed. The unexplored claims belonging to the Manhattan Company are too numerous to describe. A majority of them are situated in the rich zone of silver-bearing country that passes through the district. Most of them are known to contain good ore in the surface outcrop, and are identical in character with those lodes that have been extensively worked, and as there is not a single lode in the rich belt that is known to be barren of ore, it is reasonable to suppose that many of them will prove as good as those now being worked.

The reduction-works consist of a 20-stamp battery; 1 rock-breaker; 1 Stetefeldt chloridizing furnace; 8 amalgamating-pans; 8 settling-pans; retort-room with smelting and assay furnaces; one refining-furnace, and all the appliances needed for the proper handling of the ores. The driving-power consists of four tubular boilers, 48 inches diameter, by 16 feet long, (only two used at one time;) one engine, 18 inches diameter of cylinder, by 42 inches length of stroke; one machine-shop, with lathes, (driven by donkey-engine,) and complete set of blacksmith's and carpenter's tools. The works are complete in every part, and capable of reducing 20 tons of ore per day of twenty-four hours. There is no mill in the State that does better work or is kept in more constant use.

The reduction-works as they now stand, including furnaces, shops, storehouses, offices, &c., have cost the Manhattan Company about \$180,000.

The hoisting-works and pumps on the different mines have cost as follows:

Oregon hoisting-works	\$22,800 12
North Star hoisting-works	18,876 75
Mohawk hoisting-works, (donkey)	791 05
South America hoisting-works	1,204 58
Whitlatch hoisting-works, (donkey,)	758 26
Isabella hoisting-works	7,000 00
Dollarhide hoisting-works	1,500 00
Grover Tunnel hoisting-works	1,200 00
Two extra donkey-engines, ready for use	1,800 00
Two extra horizontal engines, 10 by 20 inches each	1,600 00
Approximate total cost of machinery and improvements	237,530 76
Add to this the cost of mines and properties purchased within the last five years	92,712 83
Explorations and dead work for opening the mines, estimated	200,000 00
Cash investment, exclusive of original purchase	530,243 59

The present stock of supplies on hand is as follows:

Salt in store-house	\$13,848 35
Quicksilver	9,700 18
Fuel, (wood and charcoal)	34,292 72
Tools and extra machinery	16,658 29
General supplies—steel, powder, candles, oil, &c.	24,622 79
Mine and mill timbers	1,800 66
Stable supplies	2,673 49
Live stock and wagons	3,028 50
Total supplies on hand January 1, 1873	106,624 98

This large stock of supplies is necessary for the winter months, but is allowed to run down in the spring and summer to about one-half the above amount. This will make the average stock of supplies necessary for the efficient management of the business about \$75,000.

During the years 1868-'69 the company had much difficulty in procuring efficient labor. This was owing to two causes: 1st. The discovery of the White Pine and Pioche mines drew off a large portion of the best miners, leaving a very indifferent class of workmen in this district; and 2d. The veins being small and the underground work much spread out and scattered, it was found to be impossible to get faithful, honest work done. These difficulties appeared at one time to be almost fatal to the success of the enterprise, but they were overcome by a radical change in the labor management.

This was effected by the adoption of the contract and tribute system for all under-

ground work. This change could not be made suddenly without a large falling off in the product of the mines, but the company contented itself with doing custom-work in their mill, and allowing the work on its own mines to lie comparatively idle. The miners, however, gradually became reconciled to the change, and the work of development and consequent yield of the mines has steadily increased during the last two years. The present tribute system has become established, and a good supply of Cornish miners are now settled in the district.

Manhattan tunnel, (6,000 feet long.) It is proposed to run an adit level or drain-tunnel from the southwest base of Lander Hill, commencing at the mouth of Pony Cañon below the town of Austin, and drive it on a line N. 83° E., magnetic, to the Oregon shaft, a horizontal distance of 5,560 feet, and thence until the North Star lode is cut, making a total length of 6,000 feet. At the Oregon shaft the vertical depth will be 760 feet below the surface, and at the intersection of the North Star lode the vertical depth from the surface will be 810 feet.

The advantages claimed for the proposed level are, 1st, the drainage of the rich belt of ground to the lowest possible point; 2d, furnishing a cheap line of conveyance for all ores extracted within reach of the adit; 3d, giving better ventilation to the mines than can be procured from the surface alone; and 4th, the chances of making valuable discoveries of lodes that do not crop to the surface, or that are not known to be rich at the surface, and have not been explored in depth.

The operations of the Pacific Mining Company (limited) have not been very encouraging. The report of the directors states that the value of the bullion sold during the past year is £22,692, of which £13,430 was for ore milled with the Manhattan Company, and £9,261 for bullion produced from the Mettacom Mill, and from the sale of ores in Liverpool. Up to October the directors had the fullest hope of continued remittances, but a letter then received from Captain Prideaux gave the first intimation of a break in the vein at the 400-foot level having occurred, and the consequent serious falling off in quantity and quality of the ore. From this date the mine has been worked at a heavy loss. The operations at Lander Hill have been brought within the narrowest limits, and the superintendent will endeavor to meet the monthly cost from the proceeds of the mine—working it upon the tribute system. The company was indebted at the end of December, at Austin, £2,344 14s. 2d. To enable the company to continue working, the directors propose to increase the capital by 15,000 shares of £1 each, to bear a preferential dividend of 20 per cent.

The Citizens' Mill and Mettacom Mill have both worked only a very short time during the year, and were stopped entirely during the latter part.

Eureka district.—This district has continued to hold the position of the foremost smelting-district in the West. Extraordinarily large developments of lead-ore have been made in the older mines, and quite a number of other mines have sprung into notice, which were hardly known by name last year.

The Eureka Consolidated Company still takes the lead, as far as magnitude of operations and product of "base bullion" are concerned; but several other companies have sent large quantities of argentiferous lead to market, and among these the Richmond Consolidated (limited) is the principal one.

The mines of the Eureka Consolidated Company on Ruby Hill have been repeatedly described in former reports, to which I refer for general description of the work heretofore done on them. In August, 1872, when I visited the mines, the company had erected and put in operation small hoisting-works on the Windsail shaft, which connects with the Lawton tunnel. From the floor of the latter a shaft 60 feet deep had been sunk, near the east line of the Sentinel claim, which stood in an excellent body of ore. From the bottom of this shaft a drift was being driven west, which had reached over 100 feet in length and was all the

way in good ore, the latter getting richer in silver as the level progressed westward. During the latter part of the previous year and the first half of the year 1872 the ore mined by the company and sent to the smelting-works had nearly all come from the east end of Ruby Hill, partly from the Sentinel and partly from K K ground. This ore was of very low grade, containing only about 12 to 15 per cent. of lead, and rarely over \$30 in silver and gold. The consequence was that it took these 9 tons of ore to produce 1 ton of bullion worth \$260 in gold and silver. But since the drift running west from the winze in the tunnel-floor had advanced 50 or 60 feet the ore became much richer in lead and also in gold and silver. It is remarkable that the contents of gold and silver in the bullion remain always about the same, whether it take 4 tons or 9 tons of ore to produce 1 ton of lead. This shows that there is a certain and constant proportion between the contents of lead and those of gold and silver in the ore; in other words, gold and silver must both be contained in the lead-ores. At the same time it is certain that an increased proportion of arseniate of iron in the ore brings an increase of gold, over and above the usual proportion, into the lead-bullion and speiss.

The smelting-works of the Eureka Consolidated Company have undergone considerable alteration since my last report, their capacity having been much enlarged. The shape of the newer furnaces, each of which has a capacity of 50 tons in twenty-four hours, is also different from that of the older ones, being now rectangular. A more detailed description of the furnaces and their working will be found under "Metallurgy," in another part of this report. The official report of the Eureka Consolidated Company below gives the details of the company's business during the last year.

The hoisting-works on the Windsail shaft were finished on August 19; those on the Lawton shaft on September 4. Sinking has been steadily carried on in both shafts, and the ore-body has been reached in both. At the time of the superintendent's report, October 4, 1872, there were 30,000 tons of ore in sight, equal to a supply for the smelting-works for a period of six months. At the same time furnace No. 5, the last of the large class of shaft-furnaces, was completed at the company's reduction-works, which had then a capacity of 200 tons of ore per twenty-four hours. New shafting had been put into the furnace-building, to transfer the power from the engine to the breaker and the five large Sturtevant blowers. A Knowles steam-pump had also been put up, which commands the coal-pile and the smelter building.

The secretary of the company makes the following financial statement for the year ending September 30, 1872:

RECEIPTS.

For sales material, horses, &c.....	\$1,062 55
For rebate for overcharges on freight.....	1,273 42
For exchange on coin-drafts.....	3,525 87
For proceeds 3,019 tons base bullion refined, (including 1,430 tons of last year's product).....	1,159,508 78
Approximate value 1,981 tons at refining-works and <i>en route</i>	641,160 00
	1,806,530 52

DISBURSEMENTS.

For construction and improvements.....	\$54,958 54
For mine-account.....	251,802 46
For smelting account.....	680,330 26
For general expense Eureka.....	41,298 96

144 MINES AND MINING WEST OF THE ROCKY MOUNTAINS

For expense San Francisco.....	\$11,001 43
For interest, &c.....	23,125 82
For freight, refining, &c., on bullion.....	259,101 47
For office-fixtures.....	75 00
For dividend No. 6, paid stockholders.....	50,000 00
For real estate Eureka.....	1,500 00
For house for use of assayer.....	1,200 00
For wood-ranch.....	718 98
For mining-property.....	2,023 50
For bills payable.....	25,000 00
For book-accounts.....	682 88

	1,402,819 30
Balance bullion-receipts over disbursements September 30, 1872.....	403,711 22
	1,806,530 52

RESOURCES AND LIABILITIES.

Resources :

A. M. Ellsworth, superintendent.....	\$1,713 98
Supplies at Eureka, as per inventory.....	5,116 50
Charcoal on hand.....	150,665 92
Base bullion, 1,981 tons.....	641,160 00
	\$798,656 40

Liabilities :

Overdrafts.....	\$169,327 94
Drafts against bullion-shipments.....	328,588 85
Superintendent's drafts, not presented.....	9,569 10
Book-accounts not due.....	8,374 72
Bills payable.....	75,000 00
	590,860 61

Net resources September 30, 1872	207,795 79
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798,656 40

ANNUAL PRODUCT AND EXPENDITURES.

Product :

Base bullion, 3,570 tons, of which 1,589 tons have been refined, yielding.....	\$608,339 60
Base bullion at refining-works and <i>en route</i> , 6,981 tons.....	641,160 00
	\$1,249,499 60

Expenditures :

Construction and improvements.....	\$54,958 58
Mine-account, including supplies on hand.....	251,802 46
Smelting-account, including supplies on hand.....	680,330 26
General expense Eureka.....	41,298 96
Expense San Francisco.....	11,001 43
Freight and refining on bullion.....	259,101 47
Interest, &c.....	23,125 82
Office-fixtures.....	75 00
Real estate Eureka.....	1,500 00
House for assayer.....	1,200 00
Wood-ranch.....	718 98
Mining-property.....	2,023 50
Dividend to stockholders.....	50,000 00
Bills payable.....	25,000 00
Book-accounts.....	682 88
	1,402,819 34

Disbursed over annual product.....	153,319 74
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COST OF EXTRACTING ORES.

Expense of extracting and hauling to furnaces 32,170 tons of ore is.....	\$251,802 46
Supplies on hand September 30, 1871.....	3,100 00

	254,902 46
Less supplies on hand, per inventory.....	2,627 50

252,274 96

Or \$7.84 per ton delivered at furnaces.

COST OF SMELTING ORES.

Expense of smelting 3,109 tons of ore is.....	\$680,330 26	
Coal and supplies on hand September 30, 1871.....	42,425 79	
		\$722,756 05
Less supplies on hand, per inventory.....	2,489 00	
Less coal on hand, per inventory.....	150,665 92	
		153,154 92
		569,601 13

Or \$18.33 $\frac{1}{2}$ per ton.

Thirty-one thousand and sixty-nine tons of ore reduced produce 3,570 tons of bullion, or 8.42 tons of ore produce 1 ton of bullion, at a cost of \$220.43.

Transportation, refining charges, &c., aggregate, per ton, about \$18.

W. W. TRAYLOR, *Secretary*.

The Richmond Consolidated Mining Company (limited) has had much trouble during the year on account of the title to the mine, as will be seen in the following report of the directors, which also gives a limited review of the company's business :

The first year of the company's operations expired on the 31st of August last, but, as the accounts were only received on the 22d of October, it has not been possible to prepare the balance-sheet and statement of accounts earlier. The directors have on several occasions sent to the shareholders statements relating to the affairs of the company ; but as these may not have been seen by many of the present proprietors, it is deemed advisable to advert to them shortly. In order to satisfy themselves as to the value of the mine, the directors, before concluding its purchase, engaged the services of Professors Clayton and Fisher to examine and report to them thereon. Copies of these reports, which were most favorable, were sent to the shareholders. To insure the proper legal transfer of the property from the vendor, then in Eureka, the board deputed one of the directors, Mr. Streeton, a barrister, to go out to attend to the completion of the purchase, examine the property, and inquire into the best mode of conducting the business in future. Copies of Mr. Streeton's report were also forwarded to the shareholders. Within about three weeks from the date of the first general meeting, which was held on 1st December, 1871, the board received intimation from the manager, by cable, that the title of the company to its property was disputed, and an attempt had been made to obtain possession of the mine by force, which had been successfully resisted. It was extremely difficult, at such a distance from the scene of operations, to obtain full information of this attempt or of the nature of the case set up against the company ; the directors therefore cabled to the manager to hold the mine at all hazards until they could send out a representative of the company. Mr. Corrigan, a member of the board, undertook to go out to attend to this matter, and he was accompanied by the vendor, Mr. English, who had a short time previously returned from the mine. The fearful snow-storm in January last kept both those gentlemen prisoners on the railway for a month, a most unfortunate delay, which greatly increased the cost of defending the property, as it had to be retained by force during the whole of this time. The adjustment of these claims occupied a long time ; and although the local legal advisers were of opinion that there was a good ground of defense, they advised that it would be better, if possible, to compromise the matter, as some of the questions raised had never been decided by the American courts, and the company might be involved in litigation for two or three years, during which time the working of the mine would be stopped. In the end these claims were all settled by purchasing the Tip Top mine, (a property adjoining the Richmond mine,) and certain other assumed rights, which purchase the directors have no reason to regret. The directors desire to express their thanks to their manager for the energetic steps he took in defending the mine, often at the risk of his own life, and also to those who acted under him. During this period of anxiety and suspense no profitable work was done at the mine, but Mr. Corrigan and the manager availed themselves of this opportunity of putting up new and more efficient machinery and buildings, and of adding to the efficiency of the working plant generally. On the 24th May smelting operations were recommenced ; these continued very satisfactory for some time, the first new 60-ton furnace yielding as much as \$23,000 in bullion the first week in August ; the second furnace of the same dimensions did not, from some unexplained cause, succeed so well.

The directors, however, have the pleasure of informing the shareholders that the smelting is again satisfactory, as the following results will show :

	Tons smelted.	Bullion product in dolls.		Tons smelted.	Bullion product in dolls.
Week ending September 4, 1872	220	12,000	Week ending October 16, 1872	159	7,100
Week ending September 11, 1872	.....	.....	Week ending October 23, 1872	140	8,100
Week ending September 18, 1872	108	5,200	Week ending October 29, 1872	190	10,800
Week ending September 25, 1872	176	9,900	Week ending November 6, 1872	300	15,000
Week ending October 2, 1872	200	9,800	Week ending November 14, 1872	340	18,000
Week ending October 9, 1872	160	8,000	Week ending November 20, 1872	336	20,700

As regards the grade of the ores, both in the Richmond and Tip Top mine, the directors have every reason to be satisfied; the quality continues to improve, and by the last return it will be seen that we are now smelting ore of the value of \$60 per ton. The first ore reached in the Tip Top mine was not much above \$40 ore, but the deeper the shafts go the richer the ore becomes. This fact is of great promise for the future, and tends to prove the value of this acquisition to the company's property. The fear of the supply of charcoal being monopolized before the winter, induced the manager to make large contracts during the summer, and on the 3d day of September he reports having in stock 215,000 bushels; this, with the wood in store, and the 3,000 tons of ore then on the dumps ready for smelting, absorbed £21,750; but, as a consequence, the manager expects to be able to work the mine advantageously through the winter months. After payment of the purchase-money of the mine and the preliminary expenses, a sum of £18,000 only was left for working capital, erecting two new furnaces, and all other purposes. It will be seen by the statement of accounts that the cost of erecting the new furnaces, buildings, engines, and machinery of the Tip Top mine, of defending the Richmond mine, amounts to £39,921; and that the expenses of accumulating ore and charcoal for future use amounts to £21,750; together, £61,761. Of this sum a portion has been provided out of profits, and the sum of £42,440 has been transmitted from London; and in order to send this sum the directors have had to exercise their borrowing powers to the full extent, namely, £25,000. The company having been called upon unexpectedly, as before mentioned, to incur heavy and unforeseen expenses in defending the mine, the board represented these circumstances to the vendor, and urged upon him that the case was one calling for some consideration on his part, and the directors have much pleasure in stating that the vendor has placed at the disposal of the board 2,000 fully paid-up shares, which have been transferred to and are now in the possession of the directors for the benefit of the shareholders. On the 24th October last the manager wrote that a suit had been entered by the Eureka Consolidated Company, as owners of the Lookout mine, against himself and the company, asking for a survey to be made of our workings, and alleging that we were not entitled to any ore which might be under their surface-claim, (technically known as a square location.) As Mr. Corrigan at this date was about to visit America upon business of his own, the board gave him full power to attend to this matter, and at his request sent out a shareholder intimately acquainted with the process of smelting at the same time to confer and advise with him. These gentlemen left Liverpool on 2d November. From a letter since received from Eureka, the directors feel confident that the claim on the part of the Eureka Company is unjust, and one that cannot be substantiated. The accounts show a profit of £16,002 19s. 9d. as the result of working the mine during the year. Six thousand four hundred pounds of this amount was divided among the shareholders in April last, when the directors declared a dividend of 4s. per share. The remainder, £9,602 19s. 9d., will be available for dividend if the shareholders so desire. As the directors expect to be able henceforth to pay dividends quarterly, it is proposed at the meeting to ask the shareholders to authorize the directors, from time to time, to declare dividends of such amounts as they may think fit.

The case alluded to in the latter part of the report has not yet been decided by the courts.

Furnace No. 2, which is mentioned in the report as not giving satisfaction, was in the course of construction when I visited the works in the summer. It had the form of an inverted pyramid, all the sides inclining equally toward the hearth. With this exception the works of the Richmond Company are constructed in the very best and most efficient manner, though a good deal of money has evidently been expended for the sake of appearances. The company's smelting operations are further described in another part of this report under "Metallurgy."

During the calendar year 1872, the company's works have produced,

according to data furnished from the account-books by Mr. Howell to Mr. O. H. Hahn, who kindly transmitted the same to me:

	<i>Tons lead.</i>	<i>Gross yield gold, silver, and lead.</i>
First quarter.....	215.5	\$75,895 74
Second quarter.....	391.0	114,491 55
Third quarter.....	441.0	142,684 49
Fourth quarter.....	391.0	120,607 21
	1,438.5	453,678 99

The Ruby Consolidated Company (limited) is a new English company, which owns fifteen mining claims in the vicinity of Eureka. The most important of these are the Dunderberg, situated in one of the side cañons at the head of New York Cañon, about two miles south of the town of Eureka. The country rock here is shale and limestone, running north and south, and dipping west. The Dunderberg crosses these rocks nearly at right angles, running easterly and westerly, and dipping north. There are several inclines sunk, two of which follow the vein, the latter having a dip of about 8° near the surface, and down to a depth of 60 to 70 feet. Here the dip suddenly changes to 45° N. The third incline, which is intended for the main working shaft, is started below the outcrop of the vein, in the shales, which here form the foot-wall. It will strike the vein below the point where the dip becomes steeper than near the surface; but if it is to be kept straight, as it ought to be as a working shaft, it must cross the vein at inconsiderable depth, leaving the latter after that under the floor of the incline; and the deeper the incline becomes, the more will the vein recede from it, thus necessitating longer and longer levels at every station which is gained in depth. The correct way, it seems, would have been to start the working incline above the outcrop at a point which could have been easily determined by survey, and from which an incline of 45° would have struck the vein where it assumes that dip. This incline, after once striking the vein, could have been kept in it, and a shaft straight for its whole depth and for the larger part in ore would have been the result. Where exposed, the vein is from 3 to 5 feet thick, and filled in some parts with very solid oxidized ores, carrying here and there pockets and nodules of galena, while in others it contains soft pulverulent ferruginous carbonates. The claim is 1,600 feet long, about 800 of which lie in the limestone, while the rest is in the shale. The Dunderberg ore contains 12 to 16 per cent. of lead, and from \$40 to \$60 in gold and silver. About one-quarter of the latter values is gold. The ore contains a considerable proportion of lime and iron oxide. The so-called "black carbonate" occurs occasionally.

The Lord Byron, Valentine, Ida, Dudley, and Valentine Day are five claims belonging to the Ruby Consolidated Company, and situated on the south side of a lateral ridge running easterly from Prospect Mountain. Most of these are so-called "pipes," *i. e.*, round shaft-like and nearly vertical cavities in the limestone, which are partly filled with carbonate of lead, iron ore, spar, bunches of quartz, &c. Galena occurs very subordinately. These "pipes" have a diameter of from 4 to 10 feet, and have no connection between each other, at least not so far as present developments show. They are, however, nearly all situated on the contact between the limestone and a stratum of shale. Some of these pipes are excavated so as to form shafts of considerable depth, the Byron, for instance, being 210 feet deep. In the bottom is gray carbonate of lead, and above all the ore is taken out clean. There is

none in any direction outside of the shaft. These pipes are evidently cavities formed in the limestone by water. This appears from the fact that they all occur immediately at or near the contact with the shales, which are impervious to water, and which would therefore arrest the water running towards them in the limestone above.

The ore from the Lord Byron and the Valentine assays from \$40 to \$50 in gold and silver, and contains little lead. In some of these pipes occurs a mineral very much resembling stetefeldtite, which is rich in silver.

The Eldorado, also belonging to the Ruby Consolidated Company, is situated on the western slope of Prospect Mountain. A number of shallow shafts have been sunk here immediately below the summit of the mountain. These disclose a thin layer of very rich ochereous ore lying between the solid rock and the surface detritus and soil. The streak follows the slope of the mountain, and is evidently the dislocated croppings of a vein above. This seems to have been found at last on the very top of the mountain, where a narrow crevice, filled with the same kind of ore, has been sunk upon with a shaft, which was some 40 feet deep in August. The vein runs east and west, crossing the ridge, and dips steeply south. It is not over 8 or 9 inches thick, but the ore assays from \$80 to \$400 in gold and silver, and 15 to 20 per cent. of lead. This ore is the richest so far discovered in the district.

The Bullwhacker, another of the Ruby Consolidated Company's mines, lies a considerable distance away from those described heretofore in the northernmost spur of the foot-hills of Prospect Mountain, close to the plain below. It occurs in a stratum of shale running across the ridge from west to east, and which is itself crossed lower down towards the plain by a dike of rhyolite. The Bullwhacker is not a vein, but a series of pockets in a zone running east and west; all the ore-bodies dipping at varying angles easterly and southerly. The shale around and between the pockets is considerably altered, being replaced, in many cases, by a yellowish-white clay with many "slicken-sides." The ore of the Bullwhacker is carbonate of lead in a talcose and calcareous gangue; in the carbonates occur very large bodies of galena, probably larger than in any other mine in Eureka. The contents of the ore in lead vary from 35 to 62 per cent., and in silver from \$13 to \$50 per ton. The deepest shaft is 240 feet down. Several drifts run from this shaft at different depths, which all show more or less ore. The ore exposed in the upper works is mostly carbonate, while in the lowest drift, 185 feet in length, considerable galena is standing.

The Ruby Consolidated Company has erected smelting-works in the southern part of the town of Eureka, opposite the Richmond works. It was the intention of the superintendent, Mr. L. N. Dougherty, to build two furnaces, but the lateness of the season permitted only the completion of one. It is a 40-ton furnace, similar in shape to the new ones of the Eureka Consolidated, but smaller. Mr. O. H. Hahn, a metallurgist frequently mentioned in my former reports, has been engaged by the company to superintend the smelting-works. I am indebted to him for the following facts: The furnace was blown in on November 15, and, from that time to December 31, 1872, the following ore was smelted:

354. 7 tons from Bullwhacker mine; gangue calcareous and talcose; contents from \$13 to \$50 silver, and from 35 to 62 per cent. of lead.

438. 3 tons from Dunderberg; gangue calcareous; contents from \$40 to \$60 gold and silver, and 14 per cent. lead.

228. 3 tons from Eldorado; gangue quartzose; contents, \$200 silver, and 17 per cent. lead.

130. 3 tons mixed ore from the crusher; gangue quartz, clay, and lime; contents, \$40 silver, and about 12 per cent. lead.

58. 2 tons from Valentine; gangue calcareous; contents, \$40 silver, and 5 per cent. lead.

1,209. 8 tons of ore. This ore was fluxed with—

1. Ferruginous poor ores (bought) from the Marcellina and K K, containing from \$13 to \$24 in silver and gold; quantity not given.

2. Slags from the Richmond and the Phenix Works, on account of their contents of iron and silica, respectively; quantity $418\frac{10}{2000}\frac{45}{000}$ tons.

The amount of charcoal used during the above time was, including waste, 71,564 bushels, averaging 59 bushels to the ton of ore, (not counting Marcellina and K K ore.) This is much more than is generally used at Eureka smelting-works, but it is seen, from the above description of the ores, that they require a great quantity of fluxing materials, their contents of lead and iron being very small. The pressure of the blast was kept at $1\frac{1}{8}$ inches mercury.

The product was 5,006 bars of lead, containing, on an average, 140.39 ounces, worth \$181.52 silver; 3.45 ounces, worth \$71.37 gold; total, \$252.89 silver and gold, per ton of 2,000 pounds. Total weight of the bars, 449,637 lbs., equal to $224\frac{16}{2000}\frac{37}{000}$ tons; total silver and gold value, \$56,856.31.

The highest production per twenty-four hours during the campaign up to the last of December was $9\frac{18}{2000}\frac{29}{000}$ pounds. There have been no stoppages whatever since the 15th of November, and the furnace promises to run a campaign of three months at least. The average amount of ore smelted in twenty-four hours may be set down as 35 tons.

From a letter of Mr. Hahn, dated as late as January 20, 1873, I extract the following additional information:

A normal charge of the furnace is composed of—

Ore from the Bullwhacker.....	42. 00	
Ore from the Dunderberg	36. 70	
Ore from the Eldorado.....	6. 00	
Ore from the Valentine.....	15. 30	
		100. 00
Ore from the K K and Marcellina.....	63. 02	
Slag, rich in iron.....	26. 06	
		89. 08
		189. 08

The charge varies, of course, according to the quantities of ore on hand from the different mines, and according to the changes in the gangue; the quantity added of K K ore depends more or less on its moisture and its contents of lime. The Dunderberg ore, for instance, is sometimes rich in oxide of iron, and then again very calcareous; the Bullwhacker ore is sometimes talcose and argillaceous, sometimes calcareous, and often contains an extraordinarily large amount of galena, in which latter case a larger percentage of ferruginous K K ore must of course be added. The K K ore contains from 10 to 16 per cent. of moisture, while the company's own ores do not contain over 7 per cent. on an average. Sometimes it happens that none of the ore used for fluxing purposes is on hand, and in that case up to 75 per cent. of slag must be added to the charge. But, in spite of this, the resulting slag is in that case stiff and evidently too highly saturated with lime, so that it runs

badly, and accretions are formed on the tuyeres. In this latter case, about 50 bushels of charcoal are consumed per ton of ore, while the average consumption of coal up to the 18th of January, 1873, had been 44.2 bushels per ton of ore, 2,261.1 tons having been smelted with 99,958 bushels of coal. This figure includes the waste.

It is seen from these figures that the consumption of charcoal, per ton of ore, stood much more favorably on the 18th of January than it had stood on the last of December, the cause being, probably, that the furnace had reached between those dates its maximum of effectiveness.

The greatest quantity of ore smelted in twenty-four hours was 44.1 tons; the highest production (January 6) was 21,350 pounds of lead, which contained \$171 in gold and silver. The matte, or rather speiss, contained, in the first part of the campaign, when \$400 bullion was produced, \$49, the dust, \$87; later the matte contained \$23, and the dust \$33 in gold and silver, and 18.5 per cent. of lead. There is a higher value of gold in the speiss than of silver, the reason being the greater affinity of the former for arsenic. The slag contains no gold and silver, except when particles of speiss are mechanically mixed with it. The percentage of gold and silver saved directly in the lead has been 85.2 per cent. of that contained in the ore, (moisture not deducted,) and of the lead 96 per cent. The latter figure is, however, in reality, too high, as before January 1 the lead contained in the fluxes, especially the ferruginous K K ore, was not determined and counted in. The total cost of smelting one ton of ore was, up to the date above mentioned, \$20.66.

The Silver West Consolidated is a new company, which has built a furnace, opposite the Richmond Company's works, to smelt the ores from the Silver West mine and the Excelsior.

The Silver West mine is located a short distance below and west of the Bullwhacker heretofore mentioned. It is a contact deposit between rhyolite and limestone, which is opened by two shafts about 60 feet apart. The deposit was, in the summer of 1872, explored for a distance of 80 feet along the strike and 45 feet in depth. Here the mine pinched suddenly, and although the shaft was sunk, following a clay seam, which had been on the foot-wall above, for a further depth of 165 feet, there was no more ore discovered. There are no drifts below 45 feet from the surface. About 1,000 tons of ore had been taken from the mine at the time above mentioned, and not over 400 tons were in sight.

The Excelsior is situated at the head of New York Cañon, in limestone. In sinking a shaft of 100 feet in depth, 500 tons of ore had been taken out, and at the bottom of the shaft the deposit was 22 feet thick. It dips into the hill at an angle of about 40° . The ore taken out was very quartzose, containing only 3 per cent. of lead, but \$60 per ton of gold and silver, the value of the gold in the ton being about \$10. In the bottom of the shaft the ore assayed 22 per cent. of lead and \$46 in precious metals. The deposit has been followed in the direction of its length for 56 feet, the drift being entirely in ore.

The furnace of the company is a rectangular one, somewhat similar to No. 1 of the Eureka Consolidated, but having much higher and steeper boshes. The inside dimensions in the level of the tuyeres are, depth, 50 inches; width, 28 inches; boshes, 4 feet high, bringing about an enlargement of the furnace in its upper part of 2 feet in depth and 3 feet 6 inches in width. The total height above the tuyeres, of which there are ten of $2\frac{3}{4}$ inches diameter, is 10 feet.

When I visited the furnace it had only been running three days, but already on the second day $47\frac{1}{2}$ tons of ore were smelted. The charge was then:

Charcoal, 10 scoops, equal to 3 bushels; Silver West ore, 14 shovels, at 15 pounds, equal to 210 pounds; ferruginous ore from Sentinel, 6 shovels, at 15 pounds, equal to 90 pounds; total, 300 pounds; slags 2 to 3 shovels.

Six tons of ore made one ton of base bullion.

The Phenix Company's Adams & Farron mine has been provided with very good hoisting-works, which are put up over the new shaft. There is a 40-horse power engine and two reels independent of each other, the power being imparted by friction. The Adams & Farron lies east of the Eureka Consolidated Company's mines, the K K and Marcellina being intermediate claims. The new shaft was started 80 feet northeast of the quartzite in the limestone, and being perpendicular it struck the former at a depth of 300 feet. At this depth a drift of 320 feet in length was run to the north, which struck the ore first 210 feet from the point of starting. The ore is here of very poor quality. There was also some ore found in the 200-foot level. The deposit is very irregular. There appears to be a main channel running north, from which wings start sideways, continuing ore-bearing for 50 to 80 feet in length, and then cutting off abruptly. In the main channel there is, on the contrary, always some connection between successive ore-bodies, though it be only a seam of ferruginous material. The shaft was, at the time of my visit, 400 feet deep, and stood in its lower part in quartzite. In this rock small nests of ore were occasionally found, which assayed from \$4 to \$30 in silver and gold, but no large bodies have been met with. In the levels above about 1,500 tons of ore, containing from \$30 to \$35 in gold and silver, were in sight, but by far the larger quantity of the ore exposed was very poor, containing only 7 per cent. of lead and \$10 to \$18 in gold and silver.

The smelting-works of this company have been moved from their former site higher up the hill and back from the road, in order to gain a better and larger slag-dump. They have been running very irregularly both before and since the rebuilding.

A new company, the Eureka Mining and Smelting Company, has been formed in San Francisco, which is based on what was formerly the property of the Buttercup Company of New York. There are several valuable mines among those belonging to this company, but the smelting-works are almost without value, as far as the furnaces proper are concerned.

The K K, Marcellina, and several other claims adjoining these mines have also been acquired by a San Francisco corporation. The first named of these mines is well opened from the underground workings of the Sentinel, and shows an enormous body of ore, which is, however, not rich. It has so far been found that the large ore-body in Ruby Hill, on which this claim, those of the Eureka Consolidated and the Richmond Consolidated Companies are located, carries rich ores toward the west and much poorer ones toward the east.

A number of other companies, the principal ones of which are the Star Consolidated and the Lemon, have worked mines, yielding amalgamating-ores during the year, but no great results have been attained. The Lemon Company's mill has run very irregularly and not successfully; principally, I think, on account of the ineffectiveness of the White roasting-furnace attached to the mill. This is a badly-planned imitation of the Brückner cylinder, long, and of small diameter, which has not given satisfaction as a roasting-apparatus. Especially the gold contained in the ores had, up to August, defied all attempts at successful extraction, and of the silver only a part had been obtained.

The production of the Eureka works, during 1872, was as follows :

Company.	Tons lead.	Gross value Ag, Au, Pb.*
Eureka Consolidated Company	4,312.5	\$1,617,187 50
Richmond Consolidated Company	1,438.5	453,678 99
Phenix Smelting and Mining Company	443†	166,133 55
Silver West Consolidated Mining Company	241.192	92,032 10
Ruby Consolidated Mining Company	224.8	81,584 31
K K Consolidated Mining Company	120.05	39,616 50
Pinto Silver Mining Company	Silver bars	19,800 00
Lemon Mill and Mining Company	Silver bars, (estimated.)	25,000 00
	6,780.042	2,495,032 95

Mineral Hill district.—The unfortunate collapse of the English company during the summer has practically ruined this district, at least for the present. The mineral-deposits, upon which the mines of this company are located, are shown by developments to be of very small extent in depth, and are nearly all worked out. The country-rock is a stratified limestone, about 160 feet thick, which overlies clay-slates, and the deposits occurring in the top-rock do not continue in the shales. Besides this the value of the ore has always been very fluctuating. This is especially shown in the following report on the ores, taken out weekly, from July 6 to November 23, 1872 :

	Tons.	Grade of ore.		Tons.	Grade of ore.
July 6.....	20	\$50	September 14	34	\$71
July 13.....	20	60	October 5.....	64	65
July 20	20	61	October 12.....	83	69
July 27.....	17	64	October 19.....	84	76
August 3	22	64	October 26.....	70	77
August 10	21	73	November 2	62	76
August 17	22	74	November 9	63	79
August 24	24	70	November 16	63	70
August 31	30	70	November 23	64	60
September 7	31	70			

It has been rumored that the company would try to find the means of carrying on explorations in new ground, in order to possibly save in this way the very large amount of money invested ; but I am unable to learn whether these plans will be carried out.

The nature of the mineral-deposits and of the work done on them is well shown in the following report of Captain Hoskins, made to the company in July, 1872 :

In handing you my report on these mines, I am sorry that it does not fall to my lot to notice any decided improvement in them, although we have maintained our weekly results, and increased them to 40 tons per week, still, in the main funnels and other points where a discovery would be of immense value, our efforts, so far, have been unavailing to meet with a continuation of the rich surface-deposits. Queen Tunnel: This tunnel is extended south, a distance of 480 feet parallel with the ridge of the hill, and right under the main ore-deposits, and is now communicated to the shaft sunk from the center of the giant ore-chamber ; in all this distance (after the first 120 feet) no trace of ore has been seen, the rock being hard, compact limestone, crossed in many points by fissures, which show plainly the action of the water by the carbonate of lime crystal-

* Value of lead assumed at \$110 per ton.

† Number of tons estimated. Only the actual proceeds in coin were furnished by the company.

lized on the walls, without trace of mineral. We shall extend this tunnel south as far as the 120-foot level from the deep shaft, and thus be able to work here to a good advantage, which we have been unable to do this summer on account of the bad air. This tunnel is also communicated to the Troy incline shaft, and thus we have everything in good working order for bringing all the ore and waste to one ore-sorting house, which will be of great advantage during the stormy months. There is a chute put in the prospecting-shaft, and thus throws down all the ore from the Rim Rock and Giant, and passes it by car through the tunnel. Taylor Tunnel: This tunnel is being extended east by six men, and is now in over 229 feet; the ground has been generally hard, but in the last 20 feet we have struck several "vughs," or small cavities, and the rock is much mixed with spar, and altogether any change is hopeful, and further extension in the hill may prove something good. Vallejo: Our workings in this mine are confined to taking out the ore on the sides and roof of the chamber, which give about 2 tons of \$75 ore per week. Giant: The prospecting-shaft is sunk 72 feet below ore-chamber, and communicated to the Queen Tunnel, but without the discovery of mineral; this shaft being made into a chute for ore, we shall not be able to sink it again for a short time. There is very little ore standing anywhere in this mine. Rim Rock: So soon as the large accumulation of ore was hoisted from the Giant ore-chamber, we recommenced working this mine, and the quartz proved much better than we anticipated, and the six men are now breaking 30 tons of \$70 ore per week, and with a chance of its continuance for some time. The 120-foot level is extended under it without ore, but the only way in these limestone deposits is to sink on the ore until it gives out. Mary Ann: The air was so bad in 60-foot shaft that we could not possibly work it, and the men were put to strip down the west side of the ore-chamber, which pays well to do. So soon as the winter sets in we shall drive the level east from the bottom of the shaft. Great Republic: We have sunk about 8 feet for another stope, and shall carry it over the bottom of the ore-chamber; at present it shows but little ore, but hope it may improve as we progress forward. The Troy and Star mines with the Champion show nothing worthy of remark, all the ore having been nearly taken out of them. The location belonging to the Manhattan company close by the Queen Tunnel is at present worthless; there is a deposit of carbonate of lead with a little silver, and I see no reason why this deposit (even if it contained silver) should continue deeper than the many other richer deposits on the hill. The shaft is sunk about 20 feet, and has gone through the deposit and is now in limestone; but as soon as we can lease it, two men will be put there and prospect it thoroughly. We have sixty men employed in the mines, at \$4 per day, and have raised during the five months to the end of August 589 tons of ore of an estimated grade of \$71 per ton at a mine's cost, including stores, and prospecting of \$35,129. The cost of prospecting in dead-ground during the same period was \$13,084, a large amount to come out of our very much reduced ore-returns. On the question of what is best to be done in the future, my only recommendation is to keep on the Taylor tunnel as fast as possible, with the hope of meeting in depth with a channel of ground more favorable for mineral than that nearer the surface. Nothing having been done in the district deep, we have no guide to give us an idea as to what the probabilities may be of striking ore, but I am sorry to say that, after a careful examination of the hill for many months, I cannot see that there is much chance of meeting ore in depth. The deposit on surface was evidently formed by water from the top, and has no connection whatever with the interior of the hill.

HUMBOLDT COUNTY.

I am indebted for the principal report on this county to D. Van Jamep, M. E., of Unionville, an eminent authority.

Mining-operations in the county, during the year, have been prosperous in some districts, while in others they have been on the decline.

Buena Vista district.—The leading mine, the Arizona, has been steadily worked throughout the year, under the direction of the superintendent, J. C. Fall, of Unionville. From 60 to 90 men have been employed in the mine, summer and winter. The western portion, called sometimes the Fall ledge, has been mostly stoped out above the main tunnel and along the slide traversing the tunnel at about 1,100 feet from the intersection of the two ledges, (at the turn-table,) except from 300 to 400 feet front, next to the surface. That is, the slide running in a southeast course and the ledge a little west of south, it traverses the ledge in the main tunnel at about 1,100 feet from the turn-table, while it is over that distance from the tunnel, at the turn-table; so that the tunnel, the outcrop,

and the slide form a triangle. Of this triangle one corner-portion, bounded by the outcrop, the slide, and a front of 300 to 400 feet parallel to the tunnel, has not been worked out. Several efforts have been made to reach the ledge beyond the slide. At a point about 500 feet from the turn-table a drift on the ledge with a winze had been left in the working of excavations. The slide is reached here at about 160 feet from the main tunnel and at about 47 feet elevation above it. An incline was sunk on the slide, and at about 52 feet of incline the ledge was found undulating for about 50 feet nearly horizontally, and then rising at an angle of about 30° . The work was stopped here on account of water and the expense of extraction. At about 260 feet farther in the tunnel another drift, run level with the tunnel westward, has reached the slide at about 75 feet from the tunnel. This drift has been run forward for about 300 feet, sometimes having the ledge broken up and undulating above the floor and sometimes below it. It is intended to be a discharge for water and material from the ledge beyond the slide. About 300 feet west of the old Arizona and original location, a location had been made on a ledge called the Argenta. This was secured by the Arizona Association, and a tunnel has been run, following a very strong ledge, with little mineral, for about 200 feet. From what is known of the slide on the Arizona ledge, the probability is that this ledge is the Arizona, west of the slide, taking its regular dip. It has the same direction, and dips about 25° E. A tunnel on a level with the main tunnel has also been run about 460 feet west of it and for nearly 200 feet in the bed-rock. It has little bearing on the development of the mine, but may be in time useful for discharging material.

The Fall ledge, below and east of the main tunnel, has been mostly extracted as far down as the ore appeared rich enough for extraction from the turn-table to an incline sunk on the ledge 1,060 feet inside. It usually decreased in size or was cut off. The incline at 1,060 feet from the turn-table was run, about 150 feet on the ledge and stopped on account of water. Drifts at different levels have been run southward, connecting with another incline sunk about 70 feet away, and, from this, additional drifts still farther south—100 to 200 feet south of the main tunnel. The ore extracted has kept up the good reputation of the mine for richness and uniformity of yield.

On the eastern side of the mine what has been called alternately the eastern branch and the continuation of the Arizona ledge has been developed into a mine with independent outlet. Following the ledge from the inside, a tunnel was run, mostly on the ledge to the outside. The mouth of this tunnel is nearly on a level with the main tunnel and about 220 feet east of it. About 100 feet from the mouth an incline was sunk on the ledge, showing a heavy vein. About 100 feet south of this another incline was sunk about 160 feet on the ledge. The ledge is smaller here, and about 70 feet down it is nearly level; then it becomes broken and rises, becoming smaller. The work was left off at a point where it is made probable, by the indications of a change of direction in the bed-rock, that a few feet more work would again discover the ledge taking its regular dip. Much valuable ore has been taken out of this part of the mine during the year.

The old stopes of the Silver-Mining Company (a part of the present Arizona) have also yielded much ore, and a large proportion of shipping-ore. These works have been united with the old Manitowac mine by drifts. The Manitowac ledge splices with the Stewart ledge, one rising above while the other curves down.

The ore furnished by the mine has been crushed and worked by the

two stamp-mills of the Arizona Association, the twenty stamps of which it has kept at work for nearly two-thirds of the time. The mine has yielded 6,478 tons of milling ore and about 122 tons of shipping-ore, the latter yielding about \$63,000 in the San Francisco market. The mills of the company, the Arizona mill, the Silver-Mining Company's mill, and the tailings-mill, have run with but little interruption during the year. The two former have stamps, and have run on ore and tailings; the latter on tailings only. The milling-ores run from \$50 to \$70 per ton, of which 35 to 50 per cent. is extracted by the pan process; the tailings run from \$25 to \$35 per ton, of which about 35 to 40 per cent. is extracted. The Aikin furnace, built in connection with the tailings-mill, was never regularly run. A trial was made, but the unsatisfactory result, and the trouble of drying the tailings, led to its abandonment.

During the summer months the Pioneer and Inskip Mining and Milling Company had a grade constructed about three miles long, from the Pioneer mill to the Henning mine; and in October a few men were put to work on the mine. The mine is hardly fairly open, and it will take several months of labor to open it and ascertain more certainly its value. The Pioneer mill has run most of the year on old tailings, with the exception of about 100 tons of Henning ore worked on trial. The Pioneer and Inskip Mining and Milling Company through their manager, D. H. Temple, have taken possession of the Pioneer mill, and made several repairs for the better working of ores in future. The bullion shipped during the year from Unionville is \$327,291.40. The Governor Bradley and the Adams mines were discovered during the year. An incline 150 feet deep was sunk on the first, and a tunnel about 200 feet run on the second. Both mines have very rich ores in places, but need more work to ascertain their real value.

A considerable amount of surface prospecting was done during the summer.

Star district.—The Sheba mine has been worked during the year by a small force, prospecting and taking out shipping-ore for the San Francisco market. The first three months of the year the eastern part of the mine was worked on tribute by four Cornish miners. They got good wages out of the share of shipping-ore coming to them. The 5-stamp mill with concentrating apparatus has been idle, the concentration proving a failure.

The De Soto has also been worked at intervals by a few hands, taking out good shipping-ore and prospecting the mine. Some fine bodies of mineral were found in it during the year.

The dumps of the Sheba and De Soto mines containing several hundred tons of second-class ore, of a character apparently favorable to concentration, preparations have been made to erect a fine concentrating-mill. The building will be ready to receive the machinery in the first months of the coming year. It is to be propelled by a hurdy-gurdy water-wheel, with a fall of 170 feet of water. The ore will go through a breaker and two pairs of rollers, and then be concentrated by 8 Krom concentrators. Mr. T. G. Nequs has charge of the erection of the mill for the Star City Mill and Mining Company. Mr. Krom is expected to give the finishing touches by his own presence. Considerable prospecting has been going on during the year, testing the value of old claims; but thus far these efforts have not resulted in permanent working.

Sierra district.—During the year the mill for reducing the precious metals by the Paul process received several alterations. The ore was

first crushed by Dodge's crushers, and pulverized in a revolving cylinder, with balls of iron or pieces of quartz. The amount of rock put through this machinery, in a fit state for amalgamation, was very small, and a change was made, trip-hammers replacing Dodge's crushers. The trip-hammers could not be kept in order on account of their velocity, and finally a 5-stamp California battery was erected. This was run for a few months. The heavy expenses incurred ran the company in debt, and it had to stop operations. The rock worked by the mill yielded at different times \$28 per ton and \$15 per ton, mostly gold.

The Gem and the Empire mines have been prospected during three to four months of the year. Some shipping-ore was taken out of both mines, and they were again abandoned. The Tallulah mine was also worked by a small force for several months, prospecting the ground.

Central district.—The Marietta mine was worked during most of the year by a small force of men, the present owners. An incline about 200 feet deep has been sunk on the ledge, and drifts at two different depths run on the ledge to prospect the mine. Some rock from this mine was reduced by the Winnemucca Mill, and gave satisfaction to the owners, yielding net above transportation and milling \$172 per ton. The bullion bears a considerable percentage of gold.

The Teamsters' ledge has been also worked by a small force, and a few tons of ore were tried at a mill erected in the district during the year. The yield of the ore has thus far met the expenses of the mine. This ledge also yields a good per cent. of gold. Some tons of ore worked at Winnemucca Mill yielded \$225 per ton for first-class and \$72 for second-class ore. The mill put up in Unionville in 1869 for reducing the ore of the National ledge between the lower and upper towns, was bought by some of the owners of the Teamsters' ledge and erected in Central district, with some additional machinery. It has four stamps and one pan.

Relief district.—The Batavia and Pacific mine is the only one in a state of development in the district. About three miles below the mine is Batavia Mill, used for reducing the ore of the mine. The mine is in limestone. After working out a large and rich outcrop, the ledge was lost by a slip. By want of knowledge the work was pursued on a barren ledge close to the main ledge and intersecting it. A shaft was sunk on the same in hopes of finding again some rich deposit. Also, a tunnel was run below on the hill-side, calculated to reach the ledge at a good depth, with the hopes of finding it richer at that spot. These means failed to discover any ore-deposit. During the year, however, an experienced miner followed the slip, and, after running a few feet, reached again a rich deposit of ore and the continuation of the main ledge. Since the discovery, the mill, which was idle, has again started. The superintendent, Mr. Bailey, seems satisfied with the yield of the rock. The richer part is shipped to the San Francisco market through Oreana, the nearest railroad-station.

Echo district.—The mill that had been burned down in 1871 was rebuilt with a Stetefeldt furnace, and began to run in the fore part of this year, with satisfactory results to the owners. The mine belonging to the company owning the mill is the Butte mine, and the only one in active operation in the district. It has yielded enough ore for the wants of the 10-stamp mill. In the fall of 1872 Mr. Charles Hoffman made the sale of the property to San Francisco parties and has since been in charge. The sum paid for the property was about \$80,000. The new company was incorporated under the name of the Rye-Patch Silver-Mining Company. Mr. Hoffman, finding that the ores of the Butte

mines were readily worked at about 70 per cent. of assay value by the Meadow Valley process,* has ceased to roast the ores in the Stetefeldt furnace. The cost of roasting is saved; the ore is worked more quickly; and the royalty for the use of the Stetefeldt is also saved. It is now claimed that the Meadow Valley process gives better gross results than the former way of working. The Alpha Mine was worked during the year to some extent, and the ores shipped to the Reno works. The mine is now mortgaged to English parties and lying idle.

Winnemucca district.—The Pride of the Mountain has been worked during the year, and the ores worked at the Humboldt Canal reduction-works at Winnemucca. During the year a roasting-furnace and quartz-mill has been erected on the old site of the Humboldt Mill at Winnemucca, and run by the waters of the Humboldt Canal, built by a French company in the mining excitement of the early settlement of the county. The furnace was designed and built by Ginaca, of Mill City, an Italian by birth, and an old resident of Humboldt County. It is on the same principle as the Stetefeldt and Akin furnaces, but built more like a reverberatory furnace. It has a hopper above the fire-places to let the pulp drop. On dropping, the pulp is blown in and under the general arch of the furnace by a blower, which gives it a rotary motion; the heaviest part drops on the hearth directly between the fire-places, while the lighter is carried into the several compartments in which the rest of the hearth of the reverberatory is divided. This hearth is deep, and presents, instead of a plane surface, two sharp walls traversing the width, and presenting inclined surfaces to the pulp settling on them. The pulp, reaching the hearth, finds inclined planes conveying it by gravity toward three discharge-doors at the bottom and opening under the hearth. These doors are opened only when the pulp has lain in the furnace several hours. This is done to give to the pulp a chance to perfect by time any chemical change commenced by its ignition in falling. The heavy stuff dropped on the hearth between the fires is discharged in like manner. The furnace is claimed to work to 80 and 90 per cent. of assay value. The following are the rates allowed in buying ores for reduction at the Humboldt Canal reduction-works:

Ores assaying \$60 per ton, 35 per cent.; ores assaying \$70 per ton, 40 per cent.; ores assaying \$80 per ton, 43 per cent.; ores assaying \$90 per ton, 47 per cent.; ores assaying \$105 per ton, 52 per cent.; ores assaying \$130 per ton, 57 per cent.; ores assaying \$150 per ton, 60 per cent.; ores assaying \$175 per ton, 63 per cent.; ores assaying \$200 per ton, 65 per cent.; ores assaying \$225 per ton, 67 per cent.; ores assaying \$250 per ton, 68 per cent.; ores assaying \$275 per ton, 69 per cent.; ores assaying \$300 per ton, 73 per cent.; ores assaying \$350 per ton, 74 per cent.; ores assaying \$400 per ton, 75 per cent.; ores assaying \$450 per ton, 76 per cent.; ores assaying \$500 per ton, 78 per cent.; ores assaying \$600 and upwards per ton, 80 per cent. The ores of the mines of the district are reduced at this mill, and ores from all the surrounding country and along the line of the railroad are also bought by the works.

Golconda district.—The mill in this district being on a section of land owned by the railroad, and the owners having neglected to buy the land during the time allowed by law for its purchase, some sharp lawyer and his accomplices bought it from the railroad company and sold the mill principally for old iron. The Gregg mine has worked its way out

* Pan-amalgamation, with adequate amounts of salt and sulphate of copper.—R. W. R.

of debt by shipping Galena ores in small quantities to San Francisco and to the Winnemucca Mill.

Battle Mountain district.—In Galena the White mine has been run during the year, shipping ore to San Francisco. The Butte mine and the mill connected with it were attached for debt and sold. The new owners sold the mill again, and it has been transferred to Belmont, Nye County. In Copper Cañon the copper-mine has been worked and the ore shipped as heretofore.

Salt-mines.—A description of the Eagle salt-works in this county is given on a preceding page.

ELKO COUNTY.

The principal mining and metallurgical work in this county during 1872 has been done in Railroad and Spruce Mountain districts. Both of these lie south of the Central Pacific Railroad. The northern districts of the county, Cope, Bull Run, and Lone Mountain, have been very quiet.

For notes in regard to Railroad district I am indebted to Mr. O. H. Hahn, M. E., who lately constructed a smelting-furnace in the district, and Mr. C. Weberling, M. E., who is now in charge of those works.

Railroad district.—This district, almost forced into oblivion for reasons already stated in my report for the year 1870, page 152, has received a new impetus by the commencement of smelting-operations under the auspices of New York parties, forming the Empire City Mining Company. Although the principal industry of the district has been mining for copper-ores, which found a ready market, there are also deposits of argentiferous lead-ores of considerable magnitude. The majority of the mines are located on the northeast slope of Bunker Hill, a high peak of the Inskip Mountains, which are a branch of the Diamond range. The ore-bearing belt is a limestone, probably belonging to the Carboniferous age. This is frequently crossed by quartz and granite dikes, at the contact of which the larger deposits of argentiferous lead-ore, consisting in part of galena and cerussite, are found.

The copper-ores form net-works of pockets in a dolomitic rock and ore frequently intermixed with a white talcose matter and a brown-colored ore, which is probably serpentine. These copper-ore deposits have not been followed yet to a great depth. The leading mine, the Ella, belonging to a San Francisco company, has been explored to a greater extent, but chiefly by surface-work, than any of the other copper-mines in the district. It has furnished considerable quantities of chrysocolla and azurite, occasionally intermixed with tenorite and native copper, but no sulphurets to speak of, to various smelting-works in the East and at San Francisco. The copper-ores do not contain any notable quantities of precious metals, as erroneously stated in my report for the year 1869, page 186. A peculiarity of the lead-mines is the preponderance of copper-minerals near the surface. In some of the mines these disappear almost entirely, (Hussey Tunnel, Shoo-Fly,) in others they remain associated with the lead-ores (Last Chance) as depth is attained.

For the beneficiation of these lead-ores a cupola-furnace was erected by Mr. O. H. Hahn in the month of August, 1872, for the Empire City Company, near the town of Bullion, which forms a happy contrast to the worthless mud-furnaces built by former operators. It is a blast-furnace, with three wrought-iron water-tuyeres of the Keyes patent, and has a capacity of approximately 18 tons of ore per day. Its height from the base to the top of the chimney is 37 feet 10 inches; the height of the stack or shaft proper, from the center of the tuyeres to the level of the feed-door, is 10 feet; the hearth is 2 feet wide by 3 feet deep;

the throat 3 feet 1 inch wide by 4 feet deep. The hearth is inclosed on three sides by solid sandstone walls 2 feet wide, and at the front by a cast-iron plate $1\frac{1}{2}$ inches thick. The side-walls and the back are again incased on the outside by three wrought-iron plates three-eighths of an inch thick, which are fastened to one another and to the cast-iron front plate by bolts, thus forming a rectangular box, inside of which the furnace stands. The plates do not touch the walls immediately, but stand about 2 inches off, the intervening space being filled up with sand at the sides, and with a composition of fire-clay and quartz-sand at the front. The tuyeres lie 11 inches above the plates, and are inclosed in fire-bricks. One foot above the tuyeres the masonry, consisting of fire-brick on the inside and granite outside, commences to taper down to 18 inches for a height of 2 feet. From that point the furnace is carried up of common brick entirely, the feed-door only being inclosed by fire-brick. The walls from the feed-floor 9 feet 5 inches up, are 13 inches, and thence clear up to the top 9 inches thick. The blast is derived from a Sturtevant No. 6 fan, which is propelled by a 20 horse power engine, and makes about 1,600 revolutions per minute. As auxiliary machinery, a Blake's 8 by 10 crusher, and a Hooker's 1-inch steam-pump are employed. In the former all the ore which does not pass through a 1-inch grate is broken up to a size desirable for smelting. The steam-pump raises the water from a reservoir 35 feet vertically below the works into the supply-tank for boiler and tuyeres.

On the 24th of October Mr. Hahn started the furnace, but had to shut it down again on the 30th of the same month for the want of coal and iron-ore.

The ores to be here treated present the following characters:

Hussey Tunnel, assorted galena, 68 per cent. Pb, and \$134 Ag; vein-matter, lime-rock.

Hussey Tunnel, mixed ore; galena and cerussite, with 37 per cent. Pb, and \$104 Ag; vein-matter, same as before.

Last Chance, 22 per cent. Pb, and \$50 silver, mixed with silicate of copper and the silicates of magnesia and alumina; vein-matter, lime-rock, sometimes granite.

Shoo-Fly, 34 per cent. Pb, and \$64 silver; vein-matter, calcareous and brown spar, with occasional lumps of ferruginous clay.

As there were neither chemicals nor balances on hand at the time of starting, to ascertain the quantities of the slag-forming ingredients, Mr. Hahn had to make up a smelting-mixture at random, relying on ocular inspection of the vein-matter in the different ores, upon which a fictitious stoichiometrical computation of the necessary flux to be added was based.

The result was a mixture of 8.6 tons of Shoo-Fly ore, 3.0 tons of Hussey Tunnel mixed ore, and 1.4 tons of Last Chance, equal to 13.0 tons ore, with 2.0 tons of a splendid hematite, occurring in apparently large masses near the town of Highland, immediately below the mine. To every charge two shovels of slag (20 per cent.) were added. The slag ran very well, but after blowing out the furnace it was ascertained that the boshes had been corroded very much, and an iron sow of considerable size had been forming in the hearth, thus indicating a deficiency of sulphur and also of silica in the charge.

In the next mixture Mr. Hahn tried an addition of quartz in varying quantities, and found at last 6 per cent. to be sufficient for the prevention of iron sows, and for forming a slag siliceous enough to protect the furnace-walls from corrosion. As the Last Chance ore contains considerable copper-minerals, while at the same time there is not a sufficiency

of sulphur in the ores, a great portion of lead-skimmings were a necessary but unwelcome by-product of the bullion; 13 tons of ore yielded from $2\frac{1}{2}$ to 3 tons of metal, which afforded, by assay, in the neighborhood of \$200 silver, and traces of gold.

Later, Mr. Weberling was smelting only Last Chance, with one-third galeniferous Hussey Tunnel ore, and an addition of 8.6 per cent. hematite, there being silica enough in the Last Chance ore to saturate all the earths. Besides a large quantity of lead-skimmings, (nearly as much as the lead by weight,) considerable copper-matte, carrying from 25 to 46 per cent. of copper and \$40 in silver, was produced. The consumption of charcoal was from 40 to 42 bushels per ton of ore during the earlier smelting-operations.

There were smelted in 1872:

Hussey Tunnel ore.....	166.8 tons
Last Chance ore	162.3 tons
Shoo-Fly ore.....	38.8 tons
Total	367.9 tons=100
As fluxes were added:	
Iron-ore.....	41.4 tons = 11.2 per cent.
Slag	66.7 tons = 18.1 per cent.
Total	108.1 tons.

Amount of charcoal used, 16,609 bushels = 45.1 bushels per ton of ore for the average of the total amount smelted.

Product in argentiferous lead 133,617 pounds, which contained silver worth \$14,539.54.

The average contents of one ton of lead in silver were, therefore, \$217.65.

Fifty-five tons of ore made one ton of base bullion. The ore yielded 18.1 per cent. of lead, and \$39.52 silver, per ton.

As the lead-skimmings now resulting in the process are rather troublesome in the siphon-tap, the latter will probably be discarded and an ordinary tap on each side of the furnace will be substituted.

Spruce Mountain district was formed in 1871, by the consolidation of the Latham and Johnson and the Steptoe districts. It comprises an assemblage of peaks and foot-hills known as Spruce Mountain, situated forty miles south of the Central Pacific Railroad, and is connected with Humboldt Wells Station by a line of stages. Nothing but prospecting had been done up to the fall of 1871, at which time the Ingot Mining Company of Philadelphia commenced operations on the Latham mine, and in the summer following built smelting-works. I am indebted to Mr. E. F. Eurich, the metallurgist of the Ingot Mining Company, for the particulars in regard to this district.

The ore in this district occurs in deposits in a gray limestone, and consists almost entirely of carbonate of lead, containing more or less carbonate and silicate of copper, according to the locality. Galena and ores containing sulphur are not found in any considerable quantities. The silver in the ore varies from a few ounces to \$150 per ton, but no workable body of high-grade ore has been found.

The Latham mine shows a splendid deposit of carbonate ore. It crops out on the brow of a hill so near the surface that all the ore yet taken out has been mined in open cuts. The shaft is 108 feet deep, and a drift run off from the bottom cuts ore at several points. The limestone in which this ore occurs dips at a flat angle to the northeast, and as nearly

as can be judged from the surface-workings, and the various bodies of ore cut in the shaft and tunnel, the ore deposits lie between layers of limestone and dip conformably with these. From the open cut, which can furnish from 40 to 60 tons daily, the ore is run through a short tunnel to the western slope of the hill down an inclined tram-way, and is then dumped into chutes.

The Fourth of July mine, owned by the Ingot Mining Company, has a tunnel in 250 feet, the end of which runs over what seems to be the upper part of a considerable body of ore. This ore is much cleaner than that from the Latham and also much richer in silver. A little more work would show the true value of this mine.

The other prominent mines are the Monarch, Badger, Carrie, and Grecian Bend. This last is situated on the eastern slope of the mountain, and is owned by the Starr King Company, of San Francisco. It has several hundred tons of ore on the dump, and the company intend putting up a furnace as soon as possible. The other mines are at present little more than prospects of very various degrees of merit.

The smelting-works of the Ingot Mining Company, situated on the western slope of Spruce Mountains, about two and three-fourth miles from the Latham mine, are built in the most substantial manner. They are connected with the mine by a good road, down-grade all the way to the furnace. The arrangement of the works is such that there is the least possible handling of material. The ore passes through a Blake's crusher, set to $1\frac{1}{2}$ inches, and drops to the charging-floor. The furnace is of the Pily type, circular in cross-section, and is supplied with a cup and hopper-feeding apparatus. The diameter at the tuyeres is $4\frac{1}{2}$ feet, and at the top 7 feet. Height from the tuyeres to the top 14 feet 6 inches. It has eight wrought-iron tuyeres cooled with water, and $1\frac{3}{4}$ -inch blast-nozzles. The blast is supplied by a vertical direct-acting blast-engine, with a blast-cylinder 4 feet in diameter and 3 feet stroke. The engine is worked at a speed of from 18 to 20 revolutions per minute.

Although the ore occurs in limestone, it contains so much silica that an addition of from 20 to 25 per cent. of iron-ore is necessary to form a good slag and enable the furnace to work well. With the exception of a small portion present as silicate of copper, the silica cannot be detected by simple inspection, and only becomes apparent on analysis. The quantity of material, proportioned as above, and smelted in twenty four hours, is 35 tons, and the quantity of lead-bullion produced very nearly 5 tons. The ore used is almost exclusively from the Latham mine, and contains considerable copper, mostly in the shape of malachite, but sometimes as silicate of copper. Owing to the absence of sulphur from the ore, no matte is formed, and the reduced copper consequently enters the lead. Besides making the lead impure, it also makes the work about the furnace harder for the men. As the metal flows out of the automatic tap, an alloy of copper and lead separates itself from the rest of the metal and invariably closes up the siphon-pipe, so that it has to be opened before each ladling by driving in a bar, and toward the end of the run the automatic tap has to be abandoned altogether, and the metal is tapped in the ordinary manner into basins. Unfortunately, there is no means of helping this state of affairs, since sulphur-ore cannot be obtained. With enough of this last kind of ore in the charge, not only would a clean bullion be obtained but the furnace would work more rapidly and not require such close attention to keep it in good working-trim. Another point which will greatly improve the working is the construction of an air-receiver, so that the air may be forced into the furnace more regularly, instead of intermittingly,

as is now the case. The bullion produced contained 40 ounces of silver, and the slag, assayed daily about $4\frac{1}{2}$ per cent. Pb., and 37 to 50 cents Ag. per ton, rarely running above these figures. The consumption of charcoal (not pine) was 25 bushels per ton of material smelted.

WHITE PINE COUNTY.

For most of the information in regard to this county, I am indebted to Mr. A. J. Brown, of Treasure City. I visited, however, White Pine district late in August, 1872.

The unmistakable signs of dull times were upon the district. Hamilton, the chief city, was painfully quiet. No crowds congregated in its streets; the merchants were selling out at great sacrifice, preparatory to removal to Pioche or Robinson or Schell Creek, whither many of the inhabitants had gone already. The houses, even, were disappearing; for in this region of scarce building-materials, a house is frequently the companion of its occupant in his pilgrimages. It was said that seventy-five edifices, at least, had started on their travels from Hamilton during the fore part of the year; and many of those that were left stood empty, with placards vainly calling for tenants upon their locked doors.

Yet, White Pine is not utterly played out, though the reaction from the sanguine hopes and reckless swindles of an earlier time is a staggering blow, and the fresh excitements of the year have drawn off the surplus population. Between four and five hundred men were, at the time of my visit, still actively employed in the mines, and three large mills, the International, of the Eberhardt Company, the Manhattan, of the Ward Beecher Company, and the Big Smoky, of the Hidden Treasure Company, were constantly running.

The developments of the past year have tended to demonstrate that the principal mines on Treasure Hill—both Auroras, the Ward Beecher, the Silver Wave, the Hidden Treasure, the Sheboygan, and the Mammoth—are situated upon a continuous belt or channel of ore, bounded on the west by a vein or dike of calcite. The question of depth is, however, the vital one. Explorations with the diamond drill had not yet resulted in anything favorable up to end of August. The Wheeler tunnel, of the Hidden Treasure Company, was advancing toward the point where the downward continuation of the ore was expected to be found—500 feet below the surface. Indications were said to be encouraging. So far as I could learn, they consisted in the cutting of a spar-vein, supposed to be the eastern boundary of the ore-belt, and the finding of rock beyond it similar in appearance to that in which the ore occurs.

Meanwhile, the Eberhardt Company was doing much better than heretofore. The old Eberhardt mine was not being worked productively, but the Ward Beecher ground, subsequently acquired by the company, contains a large body of high-grade ore, (reported at \$100,) and kept the large International mill running. The wire tram-way, which has cost so much, was working satisfactorily, except in the matter of wire-rope, which it used up at a frightful rate. The shipments of the company were, at the above time, at the rate of \$90,000 per month.

Other mines on the hill had a good deal of low-grade ore. The South Aurora was idle, and a director of the company was on the spot to decide whether work was to be continued, in the way of exploration, or stopped altogether. The splendid Stanford mill of the company was likewise idle.

In the absence of new discoveries of milling-ore in depth, another

year would probably put an end to active production in White Pine, unless the "base-metal" mines, some of which possess undoubted value, should be again revived. The attempt to smelt in this district has everywhere failed; but the causes of the failure are not irreparable. The metallurgical difficulties, which arise from the abundance of lime and lack of silica, may be overcome by the use of ores from some of the new districts, or the cheapening of transportation may permit the sale of ores direct to buyers, in the present favorable state of the market. The failure of Mr. Mattison's ambitious and extravagant enterprise was a great injury to the district, in discouraging all attempts to handle the base ores. His works, foolishly located high above the town, now stand in the desolate glory of whitewash and gold-knobbed flag-staff, as solemnly silent as the old cemetery which adjoins them.

On August 30, the International Mill of the Eberhardt Company was destroyed by fire. Every man in town felt it as a personal loss; for all realized that this English company was the mainstay of White Pine. It was fortunate that the disaster occurred at a time when the mines of the company were looking better than at any time since their purchase, and that some time before the fire the mill was insured for \$250,000.

At the end of the year, it may be safely said that in this district the surface-deposits have been gradually exhausted of their workable ores, and, no new ones having been discovered in depth, the prospect for the future prosperity of its mining-industry is rather discouraging.

Active operations have been carried on by most of the leading companies with a view to testing their ground in depth, but thus far without making any very promising discoveries. That the ore-body is continuous from the Edgar mine to the O'Neil grade, South Aurora mine, a linear distance of 2,360 feet, has been proved beyond a doubt. In places this ore-body has been worked out at the comparatively trifling depth of 130 feet from the surface, while in others no bottom has been found at a depth of 180 feet from the surface. On the contrary, better ore has been found at the last-named depth in the North Aurora and Edgar than nearer the surface.

There has been a marked decrease in the bullion-product of the district for the year, as compared with that of 1871. This is partly owing to the decrease in the number of productive mines, and partly to the destruction of the International Mill in August last. The whole bullion product for the year will not exceed \$750,000.

Only four mills have been run during the year, and those only during the summer-months. Their running-time, with the number of stamps, may be summed up about as follows:

International, 60 stamps, 7 months' running-time.

Big Smoky, 20 stamps, 7 months' running-time.

Manhattan, 24 stamps, 5 months' running-time.

Swansea, 10 stamps, 2 months' running-time.

The Dayton, 20 stamps, and the Monte Christo, 20 stamps, have been idle.

The Trinity was erected, during the summer, near Shermantown, for the purpose of working the large lot of tailings that had accumulated in that locality during the flush times of 1869 from Eberhardt ore, worked by the mills in the vicinity. This mill differs from others in having no stamps or other ore-crushing machinery, and in its large amalgamating capacity, concentrated in one pan adapted to grinding the pulp, and one agitator. Its capacity is estimated at 40 tons per twenty-four hours. The labor necessary to run it twenty-four hours consists of—

2 engineers, at \$5 per day	\$10 00
2 amalgamators, at \$5 per day	10 00
2 pulp-carriers, at \$4 per day	8 00
For labor per day	28 00
Other expenses consist of wood, 3 cords, at \$7 per cord.....	21 00
Chemicals per day, (estimated)	12 00
Oil, lights, wear of machinery, &c.....	10 00
Superintendence	8 00
Total	79 00

Expenses per ton, in round numbers, \$2.

The amalgamation differs from that of the raw ore only in the use of sulphate of copper and salt. This mill, after having made a short run, has been compelled to shut down for the winter, owing to the severe weather having frozen the tailings.

The mines in which active operations have been carried on during the year are limited to about a dozen, most of which have produced some bullion.

South Aurora.—Operations in this mine have been confined to prospecting with the diamond drill. Six holes have been sunk to perpendicular depths, varying from 400 to 800 feet from the surface. No ore has been found. The formation passed through varies but little from the ore-bearing zone near the surface. From 500 to 700 feet from the surface the drill passed through a zone of limestone rich in well-preserved fossils, (mollusks and radiates.) Below this was found a narrow zone of limestone containing some graphite.

The actual cost of prospecting with the diamond drill may be summed up as follows:

First cost of drill-machinery, &c., including 700 feet of tubular rods, 4 sets of annular bits, and other fixtures.....	\$4,773 80
Freight on machinery	821 27

Cost of machinery delivered at mine.....	5,595 07
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Cost of boring 2,315 feet of holes, viz:

	Feet.
Hole No. 1, depth.....	101
Hole No. 2, depth.....	576
Hole No. 3, depth.....	340
Hole No. 4, depth.....	510
Hole No. 5, depth.....	417
Hole No. 6, depth.....	371
Total.....	2,315

The actual expenses of boring are about as follows:

For labor	\$3,694 00
For water*	2,652 53
For wood	568 25

Actual cost of boring 2,315 feet	6,914 78
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Cost per foot, \$2.98½.

* Water may be considered an extra expense, as it was procured under circumstances and at a cost that is not likely to occur in other localities.

This, as compared with the cost of exploring the same ground by means of shafts and drifts run by manual labor, effects a saving of about \$40,000, and has in this case apparently done the work quite as effectually, as there is no large block of ground that has not been penetrated by the drill. So far as the annular diamond bit is concerned, there can be no doubt that it is admirably adapted for testing in some measure the value of mines where it is desirable to know what the ground contains in advance of the usual explorations.

But there is yet much room for improvement in the machinery used to work the rods. Mr. Brown writes in regard to this:

It would be a great improvement, and one very much needed, if the machinery could be made to draw the rods from the hole. As at present used, almost as much time is consumed in drawing the rods as in boring. The machinery used at the South Aurora mine is altogether too weak for the strain put upon it in boring even the comparatively shallow holes so far bored in that mine. This is particularly the case with the rods and the couplings. In several instances the couplings have broken, and in one instance the rod itself has been twisted off. In all cases it has been found difficult to recover the piece left in the hole, so much so, that at the last break it was found necessary to sink a shaft 30 feet to reach the end of the broken rod. In another case they have altogether failed to recover over 100 feet of rod with the bit attached. The strain on rods working in a hole from 500 to 700 feet deep must be enormous. The rods should be made, it seems to me, as nearly solid as possible, (with the exception of the first 20 feet, which should be full size for the core.) A tube $\frac{1}{2}$ inch in diameter would be ample to admit all the water necessary. A deep square thread for the couplings would probably answer better than the present ordinary thread. Finally, the machinery costs too much by half to be generally adopted in mining, but this is a fault that will eventually right itself. The average distance sunk per twenty-four hours running-time has been about 36 feet. In many cases this would be a sufficient recommendation, as, in mining, time is often an important item.

O. H. Treasure.—Some ore was extracted from the old surface-deposits in this mine during the early summer, but it has been about exhausted, that remaining being of too low grade to admit of its being worked at a profit. The principal feature of this mine has been the Wheeler tunnel, which was started about eighteen months ago for the purpose of prospecting the mine to a depth of 500 feet from the surface. The ground has been hard and the progress necessarily slow, so that its present length is only about 425 feet. The last 100 feet has been run through what is usually termed ledge-matter in this district, viz, quartz and calcite, in this case showing traces of silver, from \$5 to \$10 per ton. If the main ore-channel maintains the same strike and dip here which it has in the leading mines of the hill above, the company need not expect to strike it before the tunnel is in 600 feet from the mouth.

North Aurora and Ward Beecher South.—These two mines are adjoining and on the same ore-body, and both belong to the same company, so that both can be described under one head. The entire length of this mine is 1,360 feet, and it contains throughout this extent a body of ore varying in thickness from 20 to 150 feet. In the central portion of the mine the bottom of the deposit has not been found at a depth of 180 feet from the surface, but this is accounted for by the fact, so far as observed, that the end lines of the ore mass dip toward the center from both north and south extremities of the mine. This immense ore-body has also extended through the South Aurora and Edgar mines, altogether a total distance of 2,360 feet, and has produced, as nearly as can be stated, 81,576 tons of ore, giving a gross yield of \$3,257,419 up to the present time. A considerable amount of ore has probably been worked of which no account can be got at present, so that \$3,500,000 would not be too high an estimate.

The Ward Beecher Company's ground consists of the mine of this name and the Edgar. The ore-body described in the last paragraph is continuous through this company's ground. About eighty men were

employed by the company during the summer, but as the ore is too poor to pay the extra cost of transportation to the mill during the stormy weather of the winter, it is considered more profitable to allow the mine to lie idle during that season. Since it has been shut down a little prospecting has been carried on and good ore has been found at a greater depth in the Edgar shaft.

Eberhardt.—Considerable prospecting has been done on this mine, but without finding anything of great value.

East Sheboygan and Copper Glance.—A small prospecting force has been employed on these mines during the year. Large bodies of ore have been opened, but of too low a grade to pay a profit in a custom-mill.

Caroline.—This mine is situated at Mount Ophir, on the west side of White Pine Mountain, in what is usually considered the "base-range." The vein lies in limestone, and is very small, rarely exceeding 8 inches in thickness, and probably averaging not over 3; yet, owing to the high grade of the ore it contains, work has been carried on profitably on a small scale. It would not be worth the notice of, nor would it pay under the loose management of, an incorporated company. During the first nine months of the present year only 42 tons of ore of all classes were extracted and worked, which gave a gross yield of \$7,795, or \$195 per ton. The ore is quite refractory.

French.—This mine, situated in the same locality as the last named, has been in active operation during the year. The ore has been shipped for reduction, and I have been unable to get the full returns.

Imperial.—This mine is situated on one of the outlying spurs on the west slope of Treasure Hill, in the "base-range" proper. In early times it was considered one of the best mines in the district, but since the failure of the Mattison smelting-works it has been idle, with the exception of a short time in August last, when 20 tons of ore were extracted and shipped to San Francisco as an experiment. The returns gave a yield of \$78 of silver per ton of ore; lead, 5 per cent.; copper, 12½ per cent. This mine may be cited as a fair representative of a large class of deposits which, considering their size and the character and value of their ores, are worthy of more attention than they have hitherto received.

On the west slope of Treasure Hill, in strata 300 feet below the geological horizon of the free-metal belt, we encounter a series of veins or deposits extending north and south through the whole length of the district, in which ores of copper, malachite, azurite, and arseniate form the predominating minerals. Most of these cupriferous veins are rich in silver. The most careful tests made of all the ores show quantities varying from 50 to 150 ounces per ton of ore, with only a small percentage of lead or antimony. The formation consists of a dark arenaceous limestone, which is much broken.

The veins or deposits found in this belt may be divided into three classes, as follows: (a.) Veins striking east and west generally vertical or dipping at a high angle. Their croppings are generally continuous for a long distance, sometimes several thousand feet, and, so far as explored—175 feet from the surface—they have been found persistent in depth. In thickness they vary from a thin seam to 20 feet. (b.) Veins striking north and south and dipping east at a low angle. The veins of this class correspond in strike and dip with the stratification of the country-rock. (c.) Irregular deposits, apparently impregnations, filling seams and cavities in the country-rock. In the first two classes named, the country on one side, sometimes on both sides of the veins, is impreg-

nated with minerals characteristic of the vein, often to a distance of 10 feet from the vein itself.

In a few of the mines in this belt lead predominates on the surface, but in one instance, that of the C. T. Fay, it has been gradually replaced with ores of copper at a depth of 150 feet from the surface.

Mobile.—This mine is situated at the head of Swansea Cañon. It has been worked steadily for the past two years. The ore is cerussite. This mine has afforded some specimens of very pure white carbonate, almost as pure as could be made in the laboratory. The vein is about 2 feet thick, strikes east and west, and dips north from 75° to 80° . A tunnel follows the vein into the hill, a distance of 250 feet from the cañon. There are about 500 tons of lead-ore on the dump, that will yield from 40 to 80 ounces of silver per ton.

Chester.—This mine is situated on the west side of White Pine Mountain, in the copper-range. The vein is situated between a siliceous limestone, the hanging, and a quartzose schist, the foot-wall. It maintains the same relations to the formation for a distance of two miles. The vein, so far as developed, is about 12 feet thick. The ore is compact and of an even grade the whole thickness of the vein, and consists wholly of chalcopyrite.

Silver Plate.—This mine has been worked constantly with a small force. During the first nine months of the year 231 tons of ore have been extracted and reduced, giving a gross yield of \$13,488, or nearly \$58 per ton.

Noonday.—A large body of good ore has recently been struck in this mine at a depth of 96 feet from the surface.

Assessor's returns of ore worked in White Pine County for the quarter ending March 31, 1872.

Name of mine.	Quantity.		Gross yield.	Remarks.
	Tons.	Lbs.		
Caroline.....	1	733	\$1,620 37	Refractory, shipped.
Eberhardt and Aurora.....	5,256	.....	169,346 20	
Do	1,030	.....	5,061 89	Tailings.
Edgar	14	1,000	249 84	
Empire.....	1	1,400	223 00	
O. H. Treasure.....	639	1,500	16,582 68	
Piermont Silver-Mining Company.....	550	.....	11,133 03	Piermont district.
Pinto Silver-Mining Company.....	393	.....	12,167 28	Pinto district.
Silver Plate	65	.....	3,579 60	
Smith	9	1,000	972 00	
South Aurora.....	17	1,380	1,881 28	
Do	3,240	.....	9,334 50	Tailings.
French	3	600	1,988 91	Refractory, shipped to Reno.
Truckee.....	12	1,600	253 75	
Total ore.....	6,964	1,213	{ 234,394 33	
Total tons tailings.....	4,270	.....		

Assessor's returns of ore worked in White Pine County for the quarter ending June 30, 1872.

Name of mine.	Quantity.		Gross yield.	Remarks.
	Tons.	Lbs.		
Caroline.....	11	500	\$3,330 00	Refractory, shipped.
Eberhardt and Aurora	2,928	625	109,987 22	
Mammoth	52	.....	1,058 20	
Noonday	35	1,000	741 50	
O. H. Treasure.....	393	.....	7,187 50	
Oliver and Sullivan.....	15	.....	2,115 75	Pinto district.
Selfrising .....	.....	1,120	77 46	
Silver Plate	145		8,788 99	
South Aurora	8	500	168 30	
Total.....	3,588	1,745	133,464 92	

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Assessor's returns of ore worked in White Pine County for the quarter ending September 30, 1872.

Name of mine.	Quantity.		Gross yield.	Remarks.
	Tons.	Lbs.		
Alceon	6	820	\$411 00	Piermont district.
Banner State	15	940	676 00	
Caroline	29	1,000	2,845 00	
Eberhardt and Aurora	4,317	1,300	166,472 00	
Elk	1	1,480	132 00	
Iceberg	66	1,000	5,600 00	
O. H. Treasure	837	1,100	14,045 00	
Page	4	370	574 00	
Piermont	230	.....	5,683 00	
Saint John del Rey .....	.....	1,430	223 00	
Silver Plate	21	470	1,120 00	
Truckee	6	1,520	511 00	
Ward Beecher	2,324	1,450	63,814 00	
Total	7,862	880	262,196 00	

Assessor's returns of bullion produced in White Pine County for the quarter ending December 31, 1872.

Name of mine.	Quantity.		Gross yield.	Remarks.
	Tons.	Lbs.		
Antelope	1	1,076	\$119 06	
Banner	1	1,831	148 14	
Columbus	6	1,137	990 62	
Eberhardt and Aurora	1,156	722	46,240 00	
Caroline	5	.....	1,700 00	
Genesee	7	1,858	152 59	
Iceberg	41	1,818	2,270 13	
Iceberg, (English company)	1	1,541	81 00	
Iceberg South	52	938	1,601 87	
Mammoth	18	1,328	522 59	
Noonday	4	481	232 87	
O. H. Treasure	254	875	10,194 37	
South Aurora	29	1,096	1,447 85	
Silver Plate	60	344	1,335 02	
French	16	.....	6,848 00	
Chloriders	24	254	2,240 81	
Total	1,782	1,299	76,124 92	

Schell Creek district.—This district has apparently not met with the success that its appearance a year ago warranted us to expect. The mines are extensive, and apparently contain ore of a fair average grade, but they have proved more spotted than was expected. Several purchases were made, during the winter and spring, of prominent mines, by capitalists in San Francisco and elsewhere.

The Woodburn was purchased by parties from the East, the McMahon and Great Western by parties in San Francisco. Considerable work has been done on all these mines, but, it seems, without satisfactory results, as the business development languishes. The Ruby Hill property was purchased by an English company, but little has been done on these mines, principally owing to legal squabbles in which the members of the company have seen fit to indulge among themselves. Early in the summer the Tehama Company of San Francisco purchased several mines, with other property, located about six miles south of Schellburn, and immediately commenced the erection of a 20-stamp mill, and the development of their property. But for some cause or other the affair was entirely closed about one month ago. Two small mills, the Henderson, at Ruby Hill, and the Livingstone, at Centreville, each containing five stamps, were erected during the winter and spring. The former

has never dropped a stamp. The latter ran for a short time on Ruby Hill ore, rather unsatisfactorily, however, as the ore contains entirely too much antimony for raw amalgamation. In short, unfortunately there has been only one enterprise carried to a successful issue in the whole district, to wit: they have succeeded in building a good-sized town at Shellburn. But at present it has evidently no visible means of support.

Robinson district.—During the past summer this district has attracted considerable attention from mining men. This is fairly accounted for partly by the great size of many of the lodes or deposits and partly by the fact that recent explorations have proved that individual mines have improved in the quality of the ore with increasing depth of the works. Several new and quite important discoveries have been made during the last summer, both in the silver and copper bearing zones of the district, and, upon the whole, we may consider the prospects for its future prosperity as rather encouraging. There is, however, one serious drawback for a western district, though scientific skill would certainly succeed in overcoming it. The majority of the ores in the district belong to the class known among the miners as base or refractory. They contain both gold and silver in sufficient quantity to be of commercial importance, but some of them represent the most complicated associations of minerals known to the metallurgist. A large class of veins, of which the Hays is a fair type, contains gold, silver, copper, iron, lead, antimony, zinc, arsenic, and sulphur in combination. Great difficulty has hitherto been experienced in working these gold and silver ores by mill-process, so as to save a fair percentage of both the precious metals; hence it appeared to the miners that reduction by smelting was really the only process adapted to the ores, but that, too, has so far been, if not a complete, at least a partial failure. Several attempts have been made at reducing them in the ordinary shaft-furnace, but in every instance a few days' run has proved sufficient to destroy the lining. The last run was made with sandstone lining, hauled from Pancake Mountain, fifty miles distant, but with no better results than had attended the previous trials. The same sandstone is used with great success in the Eureka furnaces. It is therefore to be inferred that the correct ore-mixture has not been made for the charges. Western miners are too apt to forget, or possibly they do not know, that a siliceous lining will not do for a furnace which is to smelt basic ores, and that a basic lining will, *vice versa*, not be in place for smelting very siliceous ores.

Considerable exploratory work is being done in this district, principally by two companies, the Canton and the Hays, each of which employs about fifteen men. The first-named company owns some thirty-five locations, and one shaft-furnace of moderate dimensions. They have made two or three runs with the furnace, and have produced 33 tons of argentiferous lead, worth by assay from \$250 to \$800 per ton. The ores formed in the district can naturally be arranged in two classes, corresponding to their mineralogical character and their geological occurrence.

1. Argentiferous and auriferous lead ores, occurring only in metamorphic, stratified limestone, with mainly a quartzose and ferruginous gangue. Fluorspar is found associated with the ores of this formation exclusively.

2. True copper-ores, sometimes occurring in the limestones, but mainly inclosed in comparatively recent igneous rocks.

A marked peculiarity in this district is the occurrence of immense masses of iron outcrops. They are found all along the mineral-belt, but

more abundantly in the vicinity of the igneous rocks, where they frequently attain a breadth of 500, or even more, and a length of several thousand feet. Some of them show on the surface only brown hematite, but the majority are associated with ores of lead and copper in variable quantities, and probably all will eventually prove to be the outcrops of plumbiferous and cupriferous lodes. The mineral-belt of the district is about eight miles in length by one and a half in width. Its longitudinal axis is about east and west, or nearly at right angles to the trend of the mountain-range. The eastern half is situated on both sides of a deep cañon, near the head of Murray Creek. The country in this vicinity is quite rugged and precipitous. Bold limestone bluffs, sometimes 100 feet in height, wall both sides of the cañon. Murray Creek is one of the largest streams found in Eastern Nevada, and, with abundant fall, is capable of furnishing motive-power for several stamp-mills or other metallurgical works. The western half of the belt occupies a valley, and is characterized by a succession of low rounded hills easy of access.

The mineral-deposits occur, as I mentioned before, in two distinct formations, a central one of granite and igneous rocks, and a surrounding one of fossiliferous, stratified limestone. The upheaval of the central granite rocks has tilted the stratified rocks outward in all directions; from the central mass, slightly on the north and west, and more steeply to the east and south. Subsequently, these granites themselves have been fractured along north and south lines, and rhyolite has here intruded, sometimes covering extensive areas, and in nearly every instance forming the smooth rounded hills of this portion of the mineral belt. The forming and filling of the cupriferous lodes in this formation was probably contemporaneous with or subsequent to the rhyolitic outflows, for we find extensive areas of the rhyolite thoroughly impregnated with minerals of copper. The surface-ores are principally malachite, the stain of which is found not in the seams only but through the whole mass of the rock, and as this is the product of decomposition of other cupriferous ores, we may reasonably infer that the deposit originally contained either sulphides or, what is perhaps more likely, grains of metallic copper. The latter opinion is strengthened by the occurrence of considerable metallic copper in the lodes found in this formation.

These copper-deposits contain too small a percentage of mineral to be of commercial importance under present circumstances. The largest of these copper-fields contains an area of not less than 160 acres, while the smaller ones contain from 1 to 10 acres. Very little work has been done on them. The Miami appears to be the most prominent at present. It was discovered early in November last. A perpendicular shaft has been sunk to a depth of 30 feet from the surface, disclosing a vertical fissure of small but gradually-increasing proportions. The thickness of the lode where discovered was only about 4 inches, but it has increased to 3 feet at the bottom of the shaft. The characteristic ore is red oxide, associated with considerable black oxide and some metallic copper. Malachite and arseniate of copper are also found. The Osborn is situated about one mile west of the Miami, and yields the same kind of ore. A shaft has been sunk to a depth of 70 feet.

In some of these lodes the copper appears to run out a few feet from the surface, a soft ash-like substance taking its place.

The Western, Kentucky, Ontario, Burnside, Gem, and Dirago are promising locations, but not prospected.

The principal portion of the lead-bearing zone is situated east of the copper-veins, although several valuable deposits have been found in the stratified rocks.

The Altman mine is situated on the south side of the cañon, three-quarters of a mile east of Mineral City, and near the extreme east end of the belt. This mine has been worked occasionally for the past three years, for the purpose of obtaining iron-ore for flux in the attempted smelting-operations. No value was attached to the property until it was discovered during the last summer that a large portion of the vein or deposit consisted of lead-ore, containing sufficient gold and silver to make mining for it remunerative. The gold is mostly free, and has been frequently panned out from the soft, friable mass in which it is found, sometimes yielding as high as 10 cents to the pan. This probably occurs only in the shape of nests or pockets. Several shafts have been sunk on the mine to depths varying from 60 to 100 feet from the surface. A tunnel has also been driven into the mountain 450 feet, tapping the ore 150 feet from the surface. These explorations have developed a deposit or vein of iron-stone over 100 feet in thickness from east to west, and 800 feet in length. The valuable argentiferous and auriferous lead-ore is found traversing the iron-stone gangue in irregular seams and deposits, varying from 1 to 30 feet in thickness. Probably one-tenth of the whole mass of the ledge will average \$45 per ton.

The Hays is situated about one and a half miles west of Mineral City, and near the eastern limit of the copper-belt. It is inclosed in stratified siliceous limestone, which it crosses at nearly right angles to the plane of stratification. The vein is very irregular, its thickness ranging from 1 to 9 feet. An inclined shaft has been sunk on it to a depth of 100 feet; also, a perpendicular one 60 feet in depth. In the incline the vein is continuous. The ore is quite rich in gold and silver, the latter slightly predominating. Its average value, estimated from a number of so-called average assays, is over \$150 per ton. But this is probably too high for a real average. The predominating mineral is a brown hematite, especially rich in gold, with a fair percentage of silver. But the richest portion of the ledge consists of a dark mineral, approaching very nearly to gray copper in appearance. It is the intention of this company to erect a 20-stamp mill the coming summer, for the purpose of reducing their ore by the ordinary Washoe-pan process, saving what percentage they can in the first place, but relying principally on reworking the tailings, after they have had sufficient time to oxidize, for saving a fair percentage of the gold and silver.

New district.—West of the copper-belt, and seven miles west of Mineral City, is situated the so-called New district. A considerable excitement was created here during the past summer by the discovery of a small pocket of horn-silver. But subsequent developments proved that the ledges differ in no respect, so far as the ore is concerned, from the lead-lodes in the eastern portion of the district.

Iron-stone, containing argentiferous and auriferous galena and other lead-ores, is also characteristic of this part of the district. The formation is stratified limestone.

The principal mine is the Emma. An incline has been sunk on it to a depth of 50 feet from the surface. The vein is large and fairly defined, and the ore of good grade. There are a great number of locations in all parts of the district that promise well, but I have thought it necessary to describe only representative mines of each class.

Ward district is situated about twenty miles south of Robinson, and at the eastern base of the same range. The first discovery of mineral was made in August, 1872, consequently but little work has been done. The formation is limestone, uplifted by diorite. The veins are large and well defined, and the ore is said to be rich. The gangue is gener-

ally quartzose, containing iron, copper, and manganese, the last in great abundance. The most noteworthy mines are the Paymaster, Atlantic Cable, Caroline, and Grampus. The first named has a shaft 40 feet deep. Samples of the ore have assayed from \$50 to \$300 per ton.

Pinto district.—An English company erected a splendid mill in this district, with Stetefeldt furnace, before they opened their mines, so as to assure them of a supply of ore. Subsequent explorations revealed the disagreeable fact that no mineral-deposits of any extent existed on the company's ground. Only a few thousand dollars' worth of ore was raised and worked when the company shut down their works.

Eureka district.—At the time of my visit to the neighboring Eureka district, early in September, 1872, the mines and works were idle, and there was no immediate prospect of a resumption of work.

NYE COUNTY.

Philadelphia district.—I am indebted to Mr. W. F. Leon for particulars in regard to this district, which has lately attracted the attention of San Francisco capitalists to such an extent as to induce them to make large investments in the purchase of the three principal mining-properties at Belmont.

The greater portion of the ores milled in the district during 1872 were beneficiated during the first quarter of the year ending March 31, 1872, at which time the principal mines were sold and incorporated in San Francisco, California.

1. The El Dorado South yielded, to the old owners, W. F. Leon & Co., \$93,227 in bullion. Since March this mine has been developed by sinking incline shafts, running levels, and extracting some 1,500 tons of ore, valued at about \$200 per ton. This has been stored in the ore-houses of the new company, and on the dumps, awaiting the completion of the new 20-stamp mill, which will be running the 1st of February, 1873. The mill has twenty 800-pound stamps, a Stetefeldt furnace, eight Stevenson pans, and four settlers, all costing about \$100,000.

The vein in the mine has been continuous from the surface to a depth of 425 feet, averaging 6 feet in width. The ores are chloride and sulphurets of silver and stetefeldtite. There are slight traces of oxidized copper-ores and carbonate of lead in the ore.

At the main shaft are steam hoisting-works and pumps. The company are working eighty men, and the stock is now selling in San Francisco at the rate of \$1,000,000.

The Arizona mine was consolidated, and is now a portion of the El Dorado South Consolidated Mining Company's ground. It has been developed by 2,000 feet of levels and tunnels, exposing a lode averaging 3 feet, which contains some of the richest horn-silver ever found in the district. About 600 tons out in the dump are awaiting the completion of the company's mill. The yield of this mine, for the first quarter of 1872, was \$43,860.

2. The Monitor mine, now also the property of a San Francisco company, has been developing by running levels and sinking shafts. It contains a fine vein 4 feet wide. The new 20-stamp mill of the company is now running on ore yielding about \$150 per ton. The yield of the first quarter was \$74,300.

3. The Belmont Mining Company owns the High Bridge South and the Transylvania Nos. 1 and 2, and is also incorporated in San Francisco. They have been making some very extensive developments during the

year, and have large quantities of ore in their dump awaiting an opportunity to get it reduced.

4. The Combination Company's mines have been partially worked, having been under lease. They produced several hundred tons of ore. The first quarter's yield was \$55,000.

5. Washington Heights Mining Company, incorporated in San Francisco, is considered the best undeveloped mine in the district. It is now being vigorously worked.

The town of Belmont has increased largely in population and enterprise, and the district is generally conceded to be only second to Virginia City and Pioche.

A large number of claims that have been lying idle for years are now being prospected.

Morey district.—This district, located sixty-five miles south of Eureka, and upon the eastern slope of the same range of mountains, has been mentioned in former reports. The silver-bearing veins, eighteen in number, are within a belt of 3,000 feet in width. They all stand perpendicularly, cropping out at intervals from the ravine up to and over the summit of the mountain, a distance of two miles. The veins vary from 4 to 5 feet in width, and show remarkably regular and well-defined walls. The country-rock is granite. As there has been no mill nearer than Austin, by present road one hundred and five miles distant, the developments have been confined mostly to two mines.

In the Cedar there are three tunnels, the lowest starting from the ravine, the others 80 feet in perpendicular height apart. The lowest one is in 410 feet, the next 225 feet, the third 400 feet. The pay-streak varies from 6 to 18 inches. The entire ore averaged the last year \$353.53 per ton.

Upon the Magnolia lode there is a tunnel of 600 feet, one shaft of 75 feet and one of 125 feet, with a level from the last starting 70 feet from surface, and now in 175 feet. The pay-streak varies from 18 inches to 3 feet, and will average \$200 per ton; but in places the ore will work from \$600 to \$1,000 per ton. It resembles the Lander Hill ores, except that there is less quartz and more antimony.

The American Eagle has one incline of 90 feet and another of 60 feet; also three levels, each 60 feet in length. The pay-streak varies from 6 to 20 inches, and works, including second class, \$168.50 per ton.

The Mount Airy has a shaft of 75 feet upon a vein of three feet, the pay-ore occupying the entire span between the walls. The ore worked but \$62 per ton.

Upon the Little Giant a shaft has been sunk 20 feet, and an open cut of the same depth and length has been made. The ore and vein are similar to that of the Cedar.

Upon the Monetary a shaft has been sunk 20 feet, the vein containing for the entire distance two feet of pay-ore, which will work \$125 per ton. There is a 10-stamp mill in process of erection, which will be ready for operations in May, 1873. There will be a White's furnace in connection with it. About 375 tons of ore are out on the dumps, and a large amount of ground is open and ready for stoping. There are but few men mining at present, but the force will soon be increased sufficiently to keep the mill supplied with ore.

The foregoing data have been kindly furnished by Mr. David S. Ogden, superintendent of the Morey Mining Company.

Twin River district.—This district acquired at one time considerable reputation on account of the great richness of the ore-chimney found in the Murphy mine. Since, however, the New York company, owning

this mine, went foolishly into bankruptcy, the whole district has been lying idle. During the last year, however, a new company has been organized in San Francisco to take up the explorations in the Murphy and the McDonald, a contiguous claim. The Murphy and McDonald claims are together 4,000 feet in length, and were located in 1866, and developed in 1867 and 1868. The former owners sank a shaft 240 feet and opened three levels, which were driven 300 to 400 feet. The mine produced during 1867 and 1868 \$750,000 in bullion, the average working of the ore being \$117.30 per ton. The company had a fine 20-stamp mill, which has been completely renovated, new pans being provided, with roasting-furnaces. Its capacity is 600 to 700 tons per month. Included in the present purchase was a fine assortment of cord-wood, charcoal, and other milling supplies, valued at \$40,000. There are also fine hoisting and pumping works, the former company disbursing for all of the above improvements \$250,000. The present prospecting of the mine, under Mr. P. S. Buckminster, the efficient superintendent, has been successful to a degree to amply repay the owners for money expended. The second level south, and the fourth level both north and south, have been extended, cutting ore in each case of considerable extent and high in quality, and the sinking of the shaft has been resumed, showing already indications of ore. The vein is large and well defined, varying in width from 8 or 10 to over 20 or even 30 feet; the ore is rich, occurring in seams from 6 inches to 8 feet wide, and assaying from \$100 to \$300 per ton, picked specimens being of much greater value. The present company is incorporated under the name of the Murphy Mining Company; capital stock \$3,000,000, divided into 60,000 shares of the par value of \$50 each.

Troy district.—Mr. H. Newton has done some work here during the year for an English company on the Eagle and Troy locations. He has also built a fine 20-stamp mill containing a Stetefeldt furnace. Toward the end of the year it was, however, reported that all operations had been suspended. I am not informed as to the reasons for the abandonment of the enterprise. The district is represented as being well situated in regard to grass, water, and timber.

ESMERALDA COUNTY.

Very little productive work in the way of gold and silver mining has been done in this county during the year. Only in Columbus, Montezuma, Lida Valley, and Gold Mountain districts some little activity has been maintained, as far as I can ascertain. In Columbus district are situated probably the most important borax fields now known. Mr. H. R. Whitehill, State mineralogist of Nevada, says in his report for 1871 and 1872 in regard to them:

Columbus, Fish Lake, and Teal's Marshes alone contain 20,000 acres of borax land, which will yield an unlimited supply for an indefinite period. Besides the richer portions of the borax fields, there are many thousand acres on which it is found, but not sufficiently concentrated to be profitable, except in the very driest and warmest seasons. Columbus Valley, in which is located the richest deposit, is surrounded on all sides by semicircular ranges of mountains, having openings to the north and south. It is about ten miles in diameter and entirely destitute of vegetation, being covered for the most part with a light incrustation of salt, though near the borders of the valley along the slopes of the surrounding hills there are wide stretches of drifting sands, which in many places form large mounds. Water is usually found at a depth of about 12 feet. At the north end of the valley, which is the lowest, it comes to within 2 or 3 feet of the surface. Near the foot-hills to the west side of the valley it is found free enough from the salts to be good for drinking purposes.

The borate of lime (ulexite) is found in small quantities in all parts of the valley. But the principal deposit is near its northern extremity, where the wash of the whole valley and surrounding hills is collected. It forms here a large bed, which is covered

with a coating of salt. This accumulation varies in thickness with the moisture of the ground, growing in warm, dry weather, and shrinking again in wet, cold weather. The whole surface is elevated several inches in the early part of the summer, and keeps on increasing until the first rains. It rises and falls somewhat in the manner of a great pan of dough. Every time, however, that this increase and diminution takes place, there is left an additional quantity of the solid material. Four years ago, where now the bed is nearly 2 feet in thickness, out of holes dug in the marsh were taken small balls of this substance no larger than birds' eggs. These have grown until they vary in size from the bulk of a potato to that of the solid bed 2 feet thick. There is a stratum of salt underlying the borate bed a few inches in thickness, and beneath this a bed of sulphate of soda, (glauber salts.) Beneath this beds of clay and sand alternate to an unknown depth. A well has been sunk 28 feet through this sedimentary formation without finding anything harder. The borate of soda is also found on this marsh. Messrs. Eaton & Smith, of Columbus, have probably the best location. Several other companies also have borax lands on the same marsh, only two of which, however, are engaged in its manufacture.

The process of refining here is very similar to that of the American Company in Churchill County; but, as the material is much purer, a greater quantity is produced at much less expense. Mr. Hearne, with six tanks, each holding two thousand gallons, crystallizes one ton of borax daily. The Pacific Company have thirty tanks in use refining. This company has been engaged heretofore in concentrating the crude material and shipping it to San Francisco. The companies at work here use only the borate of soda, as it contains the chief elements in the composition of borax. When the borate of lime can be found pure, or nearly so, it is more profitable to ship and manufacture it near market, a large proportion of the carbonate of soda and water being used in the process of crystallization, and these materials can be obtained nearer the railroad. Materials obtained here contain about 31 per cent. of borax. The cost of manufacturing is about \$40 per ton; the price of freight to the railroad is \$80 per ton.

Rhode's borax field lies fourteen miles northwest of Columbus. There are several hundred acres of borax lands here. Native borax, in large white monoclinic crystals, is found in the mud near the surface, from six inches to a foot in depth. Other borates are also found here. The marsh is very soft and muddy, the waters coming close to the surface, and in wet weather covering it. There are also here about 1,000 acres of salt lands, from which the mills at Belmont and Columbus are supplied. The following analysis of the borate of lime was made by Professor Price, of San Francisco, from samples taken from fourteen tons of the material obtained at Columbus:

Sesquioxide of iron and alumina.....	2.25
Chloride of sodium and potassium.....	6.25
Sulphate of soda.....	2.70
Lime.....	11.10
Boracic acid.....	36.24
Water.....	29.35
Insoluble residue.....	12.15
Total.....	100.04

Lida Valley and *Gold Mountain districts* have, probably owing to their isolated location, not made as much progress during the year as was expected. From some of the mines in the former district small lots of ore have been worked in the Deep Springs mill, the pulp-assays of which are herewith given:

Names of lodes.	Value per ton.
Simon Pure	\$1,303 00
Sewana.....	1,171 00
Mountain View.....	1,016 00
Bennett.....	1,012 00
Oro Fino.....	896 00
Lida Bella.....	724 00
Frenchman.....	425 00
Martin & Henry.....	386 00
Monitor.....	330 00
Rappahannock.....	265 00

Brown's Hope, owned by the Deep Springs Mill Company, is reported to have produced ore that worked much higher than any of the ledges named.

In Gold Mountain district, twenty miles north of Lida Valley, there are many fine ledges, about one hundred locations being on record. The developments made on some thirty-five ledges are from 10 to 75 feet in depth. In many of the lodes gold predominates. Though this district is much the senior of Lida Valley, very little has been done in it, save on the State Line ledge, until since the organization of Lida Valley. Bordering on the undisputed domain of the "noble red man," its attractions have not hitherto been appreciated. There are at present about twenty miners in the district, all buoyant with confidence in soon realizing handsome compensation for their labor.

LINCOLN COUNTY.

Ely district.—This district, popularly known as the Pioche, but legally denominated the Ely district, is at present, next to the Comstock, the most important on the Pacific slope. This statement is justified by the figures of the bullion-production, from which it appears that during the twelve months ending August 1, 1872, the district shipped in fine silver bullion, \$5,151,234; in base bullion, (100 fine in silver,) \$127,173; and in gold \$42,600; total, \$5,321,007. I visited this district late in August, 1872.

The large production had been obtained almost entirely from two veins (or one vein with a spur that joins it) and by two companies, the Meadow Valley and the Raymond and Ely. At that time it was a single enormous and extraordinarily rich body of ore, in one of the mines of the latter company, which maintained the reputation of the district. Outside of the veins upon which these two companies are located, the numerous incorporated and unincorporated enterprises of Pioche were of various degrees of merit and probable success. Many of them were encouraged by the circumstance that the country-rock outside of the main ore-veins already known, abounds in seams, pockets, and small bodies of ore, which yield rich mineral, and, in some cases, repay the cost of exploration.

Wildcat claims were, of course, innumerable, as they always are in the neighborhood of really good mines. The miners of this coast should know by stern experience that "extensions" seldom prove profitable, when they adjoin claims containing rich bodies of ore. Of course, while the limits of a bonanza are uncertain, it is always worth while to explore adjacent ground; but the owner of the ground just beyond the bonanza is frequently all the worse off by reason of the good fortune of his next neighbor. The reason is simple enough; the concentration of rich ore in large bodies is likely to leave barren spaces and zones in the ore-bearing channel or vein of equal or greater dimensions. Moreover, every vein has two ends, and the location of extensions without discoveries is a method of "going it blind," with decidedly unfavorable chances, for one is doubly ignorant, first, as to where the vein goes, and secondly, as to whether it goes anywhere at all. I believe "practical" miners know these facts quite as well as "scientific" ones; but there is this notable difference between them, that the former always regard the enterprises in which they are for the time being engaged as exceptions to all the rules of experience, while the latter are less subject to believe in "anomalies." But it is only when such undertakings are bolstered up by misrepresentation, exaggeration, wild "practical" theorizings, and the like; when they are made the media of stock-jobbing, or the leaky receptacles of "foreign capital," that they pass from the realm of legitimate adventure into that of deceit and folly.

Combined with them in many cases were the blackmailing and piratical claims. The recent Federal mining law, providing that claimants shall not hold possessory titles without working, has produced, for the present, a medicinal aggravation of the disease it is calculated ultimately to cure. Thousands of ancient "claims," which were slumbering peacefully, have been revived suddenly, because, if they do not speak this year, they must forever after hold their peace. Pioche, like so many districts in Utah, is cursed with old locations to a dreadful extent; for it was unlucky enough to lie in the track of Connor's California volunteers of 1864, who spent their leisure time, when they were not killing Indians, in locating mines. Development they effected little or none; but there are few good mines in the region over which they campaigned which they are not ready to identify as the very places where they camped, made a fire, noticed lead or silver sweating out of the hearth, "located" the ledge, and entered the record in a book, which (if anybody doubts the story) is still to be seen. All these soldier-districts have since been re-explored, re-organized, and covered with successive crops of new claims; and the result is universal unsoundness of mining-titles. I do not think a United States patent was held, at the time of my visit, by any mine in Pioche; and I am sure there is not a mining company there concerning which I have not been wisely assured by some knowing outsider, that, "in reality, sir, they don't own a foot of their ground."

Out of all this confusion, two classes of persons reap a rich harvest, lawyers and "roughs." The former are paid to maintain the titles, and the latter to hold the ground. Pioche has been a bloody camp; but it is to be hoped that the days of violence are passing away. The lawyers, however, still have a strong hold, and the complexity of suits and cross-suits is such as no stranger can hope to unravel or comprehend. I notice that the Meadow Valley Company's report for the year ending July 31, 1872, contains an item of about \$37,000 law expenses, more than balanced, however, by receipts of nearly \$54,000 "in settlement of adverse claims;" while the Raymond and Ely, though it reports (for the year 1871) only \$13,349 under the particular head of "law," returns a significant item of \$108,798 for "lands, claims, and titles," a large part of which was undoubtedly expended to avoid the cost and risk of litigation.

The proportion which these two mines have furnished of the bullion-product of the district may be seen from the following statement for the year ending August 1, 1872—the period for which the total production has been given above:

Month.	Meadow Valley.	Raymond & Ely.
1871—August	\$173,269 04	\$119,190 10
September	150,643 98	191,826 39
October	182,335 40	207,202 71
November	156,423 30	261,692 34
December	123,016 78	167,123 07
1872—January	141,911 14	179,785 44
February	133,122 20	198,254 38
March	153,406 17	319,977 64
April	111,033 27	317,710 23
May	120,290 18	335,910 01
June	95,666 59	328,796 13
July	87,290 31	344,699 68
Total	1,628,408 36	2,972,168 12

It thus appears that these two companies have produced \$4,600,576 out of \$5,321,007, or nearly 87 per cent. of the total yield of the district. Their reduction-works comprise the 20-stamp mill of the first company, located at Lyonsville, in Dry Valley, and the two mills of the latter company, of 20 and 30 stamps respectively, located at Bullionville, Meadow Valley. The sudden increase of the Raymond and Ely monthly product, in March, 1872, indicates the time when the new 30-stamp mill went into operation.

The mines are situated in a range of hills running nearly east and west—contrary to the usual meridional direction of the mountains of Nevada. The immediate country-rock is quartzite, dipping northward; but an anticlinal passes along the northern face of the mountain, above which (topographically speaking) the rocks dip south. The elevation on the two sides of the anticlinal has not been equal, and the result is that the rocks on the two sides correspond neither in character nor in position. On the north we have the quartzite, dipping in that direction; on the south, a belt of magnesian shale, lying steeply and closely across the edges of the quartzite strata, and above this shale, heavy beds of limestone, also dipping south. The principal silver-bearing vein is in the quartzite, and courses not far from the anticlinal, with a general parallelism, but dips south, from 50 to 80 degrees. It is beyond doubt a fissure. So far as it can be studied from present developments, this vein branches into two as it is followed eastward; and both these branches have been extensively and productively worked. To gain some notion of the relative position of the mines, let the reader imagine himself standing at the point of bifurcation, and looking north. Behind him rises the mountain, before and below him clusters the town of Pioche, and beyond that the wide prospect of a vast valley, bounded by mountain-ranges far away. To the right, the two divergent branches of the vein are thickly set with shafts and hoisting-works. They differ in their course about 20 degrees. To the left (west) the single vein continues, barring a break, caused by a barren cross-course of brecciated material, mischievously interjected by nature to help the lawyers. The different claims lie on the surface as follows: West of the bifurcation, the Meadow Valley Company holds 340 feet; east of the same point the same company holds 1,520 feet on the north branch, and 460 feet on the south branch, making, in all, 2,320 feet of continuous mining-ground, through the whole of which the workings of the company extend, constituting a magnificent mine.

Next to the Meadow Valley line on the west, comes the Panaca mine of the Raymond and Ely Company, covering, I believe, 600 feet, and containing the most remarkable body of high-grade ore now to be seen on this coast.

On the east, beyond the Meadow Valley line on the south branch, we have the Washington and Creole, 200 feet, and the Burke, Creole, and Vermillion mines of the Raymond and Ely Company, covering, I believe, about 1,500 feet. On the north branch, beyond the Meadow Valley line, comes the Pioche Company's ground, about 400 feet. Finally, there are on both ends, and hovering about the claims enumerated, countless "extensions" and adventures, which help to make things "lively" in the district; and high up on the hill, sometimes even in the limestone, hopeful and enterprising people are digging and boring into the bowels of things, and hoisting much rock. Among the outside mines of notoriety are the Sunbeam, Excelsior, Bowery, American Flag, Chief of the Hill, Desdemona, Hahn and Hunt, Alps, Spring Mountain, &c. Some of them are reported to be making money. I can vouch that

they all make more or less noise. The following table shows the feet and shares in the principal incorporated mines of Ely mining-district:

Name of mine.	Feet in mine.	Shares per foot.	Total shares.
Alps.....	700	37½	30,000
American Flag.....	1,200	25	30,000
Bowery.....	1,000	30	30,000
Chapman.....			
Chief of the Hill.....	800	25	30,000
Condor.....	1,200	20	24,000
Excelsior.....			12,000
Harper.....			
Hahn and Hunt.....	1,000	30	30,000
Ingomar.....	1,000	30	30,000
Lillian Hall.....	1,000	15	15,000
Louise.....			
Meadow Valley.....	24,023		60,000
Meadow Valley, west extension.....	200	30	60,000
Mocking Bird.....	1,000	30	30,000
Pacific Tunnel.....	1,200	25	30,000
Pioche.....	1,000	20	20,000
Pioche, west extension.....			
Raymond and Ely.....	4,000	7½	30,000
Sterling.....	1,200	25	30,000
Washington and Creole.....	200	150	30,000

To return to the two principal mines.

The Meadow Valley was, for a while, the leading enterprise of the district; and the large amount and the favorable location of its ground will secure to it a long lease of life. But it is not denied that, for the past year, its brilliant prospects have waned into temporary eclipse. That is to say, the reserves of the rich ore have been reduced without the development by explorations of equivalent resources for the future. The superintendent reported, August 10, 4,500 tons of first-class ore in the developed sections of the mine, of the gross value of \$360,000—about three months' work at the usual rate for the mill. At the time of my visit, however, the mine had assumed a more promising appearance at several points, and particularly in the bottom, at a depth on the vein of 750 feet—the deepest point yet attained in Pioche—where a body of rich ore of unknown size had been penetrated for a few feet. It is a curious illustration of the sensitiveness of the San Francisco stock-market, that the discovery of this body, before anything had been learned as to its size and value, being reported secretly by spies to parties in that city, caused a rise in the stock which represented an increase in the valuation of the mine of nearly a million dollars.

The Raymond and Ely is now the leading mine of Pioche. The older claims of this company, on the south branch, viz, the Creole, Burke, and Vermillion, have had their day. It was not an extraordinarily brilliant day, at the best; and whether it will ever dawn again is uncertain. Of course there are possibilities "in depth;" but at present no ore is extracted from them. It is the Panaca mine, away west of the bifurcation, and separated from the other property of the company by the intervening ground of the Meadow Valley and the Washington and Creole, which now forms the basis of the almost unexampled prosperity of the company. The vein does not here come to the surface at all. The Lightner shaft, sunk vertically, and almost at random through the magnesian

shale, crossed the anticlinal, and entering the quartzite, struck immediately the upper edge of the vein, and developed a body of rich ore, which has produced already some \$2,000,000, shows as much more in the reserves now standing, and gives as yet no sign of approaching termination in depth. The length of the body in the fifth level (vertical depth 423 feet) is upwards of 550 feet; its height thus far developed is 335 feet; and its thickness varies from one to four feet of first-class ore, assaying on the average, say \$150. The mills, treating 90 tons daily, produce from \$11,000 to \$13,000 every twenty-four hours. The ore contains chloride of silver, with carbonates of lead and various of the true silver-ores. The Meadow Valley ore has been similar, but baser and poorer.

What reflects most credit on the management of the Raymond and Ely is, however, not the richness of the mine, for that is sheer luck, but the fact that, *in spite of its richness*, it is worked with care, economy, and skill. We are accustomed to see mines in bonanza butchered, and their proceeds squandered. There is no doubt that the Raymond and Ely, instead of paying regularly \$210,000 monthly in dividends, could have been so pushed as to pay for a while a much larger amount, and the stock could have been driven up from \$170 (representing \$5,100,000 for the whole,) to above \$200 per share. But the normal rate of extraction for a mine is determined by the rate at which shafts can be sunk and new levels opened in depth, not by the ease with which existing stopes can be stripped; and this principle had here been borne in mind. The result was great steadiness in the value of the stock, and confidence on the part of the stockholders, whose interests are not made the foot-balls of the street.

Fine-bullion product of the Ely district, Nevada, for 1872.

Date.	Amount.	Date.	Amount.
January.....	\$278,206 92	July	\$522,785 84
February.....	314,054 29	August.....	427,241 54
March.....	502,954 74	September.....	450,865 42
April.....	421,920 16	October	454,557 05
May	508,276 61	November	508,086 19
June.....	467 431 52	December	420,343 89
Total amount of fine bullion		5,276,724 17	
Amount of fine bullion produced by the Meadow Valley Mining Com- pany for 1872		\$1,180,447 81	
Amount of base bullion.....		123,068 09	
Total yield for the Meadow Valley Mining Company		1,303,515 90	
Gross amount of fine bullion.....		\$5,276,724 17	
Gross amount of Meadow Valley Mining Company's base bullion.....		123,068 09	
Total yield of bullion for 1872.....		5,399,792 26	

Dividends paid during the year ending December 31, 1872.

Date.	Raymond & Ely Company.	Meadow Valley Company.	Pioche Company.	Grand total.
January	\$90,000 00	.....	.....	.....
February .....	.....	.....	.....	.....
March	150,000 00	\$90,000 00	.....	.....
April	210,000 00	90,000 00	.....	.....
May	210,000 00	60,000 00	.....	.....
June	210,000 00	60,000 00	.....	.....
July	210,000 00	.....	\$20,000 00	.....
August	210,000 00	.....	20,000 00	.....
September	210,000 00	.....	.....	.....
October	210,000 00	.....	.....	.....
November	210,000 00	.....	.....	.....
December	150,000 00	60,000 00	.....	.....
Total	2,070,000 00	360,000 00	40,000 00	\$2,470,000 00

The following statements are taken from the secretary's report of the Meadow Valley Company for the fiscal year ending July 31, 1872 :

Cost of production of bullion, and profits realized.

MINING-DEPARTMENT.

Exploration and dead work	\$130,472 54	
Labor in extracting ores	222,425 17	
Mining-supplies	109,873 88	
Freight from San Francisco on supplies	9,629 87	
Contingent mine-expenses	4,833 16	
Salaries	16,516 62	
Total expenditures in mining-department	493,751 24	
Deduct amount of inventory of supplies on hand at date...	19,041 11	\$474,710 13

MILLING-DEPARTMENT.

Ore-transportation from mine to mill, (ten miles)	81,595 56	
Chemicals, quicksilver, and other supplies	238,158 27	
Freight from San Francisco on supplies	41,548 09	
Labor in reduction of ores	67,419 95	
Contingent milling-expenses	2,668 00	
Assay-office expenses	9,916 10	
Total expenditures of milling-department	441,305 97	
Deduct amount of inventory supplies on hand at date	\$76,090 52	
In transitu	3,409 31	
	79,499 83	361,806 14

MISCELLANEOUS.

Freight on base bullion to San Francisco	3,016 52	
Discount on bullion-yield for current year	45,516 68	
State of Nevada taxes on bullion, \$24,267 79; mill, \$1,935...	26,202 79	
Exchange	1,578 32	
Insurance premiums on mill-property	2,385 62	
Telegrams	2,325 96	
San Francisco incidentals	6,709 77	
San Francisco salaries and trustees' fees	8,825 04	
	96,560 70	
Total expenses	933,076 97	
Net profits for the year	710,012 62	
	1,643,089 59	

Receipts from bullion and other sources.

By bullion proceeds of company's reduction-works at Lyonsville, as per tabular statements of general superintendent for the fiscal year ending this date.....		\$1,628,408 36
By rents of boarding-houses for workmen.....	\$1,000 00	
By sales of materials—		
Mine-supplies.....	3,013 73	
Mill-supplies.....	8,326 95	
By interest.....	91 47	
By foundery-account—		
Net sales of castings.....	2,249 08	
		<u>14,681 23</u>
		1,643,089 59

The following is a summary of the fiscal transactions of the same company for the full corporate term ending July 31, 1872:

Permanent investments, dividends, and current resources.

PERMANENT INVESTMENTS.

In mine-properties—		
For the fiscal term 1869-'71.....	\$289,588 17	
For the fiscal year 1871-'72.....	37,402 56	
		<u>\$326,960 73</u>
In construction of mining-works—		
For the fiscal term 1869-'71.....	44,808 53	
For the fiscal year 1871-'72.....	21,657 07	
		<u>66,460 60</u>
In construction of reduction-works—		
For the fiscal term 1869-'71.....	214,066 32	
For the fiscal year 1871-'72.....	30,422 45	
		<u>244,488 77</u>
Total permanent investment.....		\$637,910 10

DIVIDENDS.

Paid to stockholders, for the fiscal term 1869-'71.....	330,000 00	
Paid to stockholders, for the fiscal year 1871-'72.....	690,000 00	
		<u>1,020,000 00</u>
Total.....		1,657,910 10

CURRENT RESOURCES.

Inventory of supplies at mine.....	19,041 11	
Inventory of supplies at mill.....	79,499 83	
H. H. Day, general superintendent.....	2,408 63	
Bullion in transitu.....	38,342 76	
Cash.....	71,980 73	
		<u>211,273 06</u>
		1,869,183 16

Assessments, bullion product, net profits, adverse claims, and current liabilities.

Assessments, for the fiscal term 1869-'71.....	\$210,000 00	
Bullion product—		
For the fiscal term 1869-'71.....	\$1,671,465 66	
For the fiscal year 1871-'72.....	1,628,408 36	
		<u>\$3,299,874 02</u>
Total gross yield.....		\$3,299,874 02

Bullion cost-sheets—	
For the fiscal term 1869-'71	\$862,011 22
For the fiscal year 1871-'72	933,076 97
Total cost-sheets	1,795,088 19
Deduct rentals and sales of supplies—	
For the fiscal term 1869-'71	\$4,213 94
For the fiscal year 1871-'72	14,681 23
	18,895 17
	<u>\$1,776,193 02</u>
Total net profits on yield—	
For the fiscal term 1869-'71	813,668 38
For the fiscal year 1871-'72	710,012 62
	<u>\$1,523,681 00</u>
Adverse claims—	
Received in settlement thereof	53,811 24

CURRENT LIABILITIES.

Superintendent's drafts unrepresented	81,690 92
	<u>1,869,183 16</u>

The following is an abstract of the superintendent's report of the Raymond and Ely Company for the fiscal year ending December 31, 1872:

The ores worked at the mills during the year have yielded over 75 per cent. of the pulp assay. The two mills, 20 and 30 stamps, are in good condition, and the completion of the railroad between Pioche and Bullionville will greatly reduce the cost of transportation. The Lightner shaft in the mine is now down 623 feet—seventh level—and they are still sinking it. In this shaft above the seventh level there are 24,000 tons of ore, assaying \$125 per ton; and there are 4,000 tons of the same average value in the Creole mine, with over 12,000 tons of third-class ore on the dumps. The summary of operations for the year is as follows:

	Tons.
Ore on hand at beginning of year	1,707
Ore extracted during the year	39,369
Total	<u>41,067</u>
Ore shipped to mills	28,874
Ore reduced at mills	28,626
Ore on hand at mills	600
Ore on hand at the dumps	12,193

In the secretary's report are some very interesting items. The mine has only been in operation about two years, and since March, 1871, it has paid as dividends to stockholders the sum of \$2,685,000, including the December dividend. The dividends in 1871 averaged \$20.50 per share, and \$69 in 1872; and were at the rate of 55 per cent. of the gross receipts in 1872, against 46 per cent. in 1871. The bullion-production in 1871 was \$1,361,590, against \$3,693,936 in 1872. The total dividends have been as follows:

	1871.	1872.
January		\$90,000
February		
March	\$30,000	150,000
April	30,000	210,000
May		210,000
June	30,000	210,000
July	30,000	210,000
August	30,000	210,000
September	45,000	210,000
October	120,000	210,000
November	150,000	210,000
December	150,000	150,000
Totals	<u>615,000</u>	<u>2,070,000</u>

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RECEIPTS.

From bullion	\$3, 698, 936
Superintendent's drafts not presented	18, 005
Miscellaneous	7, 473
Total receipts.....	3, 784, 414
Cash, per previous report.....	64, 681
Total	3, 784, 095

DISBURSEMENTS.

Lands, claims, and titles.....	\$49, 781
Law-expenses	48, 385
For mining	568, 700
For milling	411, 443
Hauling ore to mills.....	152, 944
Mine-improvements	3, 890
Mill-improvements	14, 110
Completion of mill	26, 650
Taxes	80, 434
Dividends	2, 070, 000
Discount on bullion	55, 569
Advanced to Nevada Central Railroad.....	100, 000
Insurance on mills.....	7, 322
Office-salaries	7, 200
Miscellaneous	8, 568
Outstanding drafts paid.....	30, 521
Total disbursements.....	3, 635, 517
Cash on hand	148, 578
Total	3, 784, 095

Following is a statement of the assets and liabilities of the company:

ASSETS.

Improvements at mines.....	\$34, 525
Stores at mines	12, 954
Ores on dumps	640, 146
Mills, &c	198, 109
Stores at mills.....	100, 517
Ores at mills.....	33, 600
Tailings at mills.....	670, 960
Advanced to railroad	100, 000
Advanced to telegraph.....	836
Office-furniture	1, 344
Cash on hand	148, 578
Total	1, 941, 571

The only liabilities consist of the superintendent's drafts advised, but not presented, amounting to \$18,005.

Treatment of ores.—I am indebted to Mr. G. F. Williams, of the Meadow Valley Company's mill, for the following highly-interesting account of the mill-process employed in this district:

The ore of the Pioche mines contains gold, silver, and lead. Small quantities of ore from the Meadow Valley mine have assayed as high as \$7,384 per ton in gold. The value of the ore per ton, in silver, varies very much. The average ore sent to the mills gives a pulp-assay of from \$100 to \$200 per ton. The silver is partly in the form of chloride (from 40 per cent. to 85 per cent.) and partly in the form of sulphide. The percentage of lead varies from 5 per cent. to 60 per cent. As the processes of milling Pioche ores differ somewhat, they are separately given in the following:

The Meadow Valley Mining Company's mill, situated in Dry Valley, ten miles distant from Pioche, is a 30-stamp mill, dry crusher. The battery and pans are driven by separate engines. The speed of the battery is from 95 to 98 blows per minute. With this speed the company is able to crush from 75 to 90 tons every twenty-four hours. The weight of the stamps is 750 pounds each; the ore is crushed through a No. 6 screen, the holes being one-fortieth of an inch in diameter. There are fourteen "Horn" pans of a capacity of $1\frac{1}{2}$ tons per charge. As soon as a pan is charged with pulp, from 8 to 10 pounds of bluestone, (sulphate of copper) and 25 pounds of common salt are added. The charge is then ground from four to five hours. At the expiration of this time, the muller is raised, and from 300 to 500 pounds of quicksilver (according to the richness of the ore) are added, and the amalgamation is continued for three or four hours. The object of raising the muller is to prevent the grinding of the base amalgam and the consequent loss of quicksilver. The time of working the charge is from seven to eight hours. The bullion from the amalgam, as it comes from the pans, is from .300 to .400 fine. This fineness is raised by a very simple and cheap method of refining, viz, the quicksilver and amalgam, when drawn from the settlers, are poured into strainers suspended in water, which is heated by steam. The lead-amalgam and a small portion of the silver-amalgam pass through the strainer, leaving the silver and copper amalgam behind. The hot quicksilver containing the lead is drawn off into a tank and cooled with water. When cold, it is again strained, and base amalgam is the result. By this refining process, bullion from .500 to .700 fine, and base bullion from .070 to .150 fine, is obtained. The finer bullion is sent to England, and the base bullion to San Francisco. The average percentage extracted is about .75, though it has been as high as .89 $\frac{1}{2}$. In Bullionville, twelve miles from Pioche, there are five mills, aggregating 85 stamps.

The Raymond and Ely Company has two mills; one is a 20-stamp wet crusher, and the other is a 30-stamp dry crusher. The process of amalgamating at these mills is as follows: When the pans are charged with pulp, about three pounds of sulphate of copper and thirty pounds of salt are added. The muller is kept continually raised, so that *no grinding* takes place in the pans. The result of not grinding is, that finer bullion is produced. The time of working the charge is eight hours. The bullion is from .900 to .950 fine. It is claimed that from 75 per cent. to 80 per cent. of the silver is extracted. It is the intention of this company to change the dry crusher to a wet crusher, the percentage obtained being equally high from wet as from dry crushing, while much more ore can be worked in the same time by crushing wet. W. H. Raymond owns two mills, one a 10-stamp and the other a 5-stamp mill. These mills are kept constantly running, partly on ore from his own mines and partly on custom-ore. The process of working is the same as at the Raymond and Ely mills. The American-Flag mill is a 20-stamp mill. It was changed from a wet to a dry crusher, and a Stetefeldt furnace erected in connection with it. At this mill, chloridizing roasting was attempted, but the amount of sulphurets necessary to decompose the salt were not present in the ore. In order to remedy this difficulty, sulphur from the mines of Utah was mixed with the ore. With what success this experiment was attended I do not know; suffice it to say, the Stetefeldt furnace has not been in use for many months. During the past summer the Condor Company built a roller mill. It is a mill without stamps. The ore is first put through a rock-breaker, then passes between two rollers, and is crushed to about the size of hazel-

nuts. In this state it goes into the pans, where, in the course of two or three hours, it is ground very fine. The pan used is the Hepburn roller pan. The result of this process was very base bullion, and a very low percentage extracted. The mill is now idle, awaiting the arrival of stamps.

The slimes from the Pioche ores are poorer in silver but richer in gold than the ore itself. The percentage of gold amalgamated is only about .40 in a wet-crushing mill. This is due to the loss of gold, which floats off in the water and settles with the slimes. Mr. Williams experimented considerably on tailings, which have been in the pit for about a year. He found that by the present process he could extract about 66 per cent. of the silver from them. The bullion, however, is baser than that which was first extracted from the ore. There are, also, experiments on the Meadow Valley ore in contemplation, to ascertain the percentage which can be obtained by *not grinding* in the pans.

It is, however, probable that a thorough grinding of the pulp, from wet crushing, will give the best percentage, and that the fine bullion and fair percentage obtained by the Raymond and Ely Company are due to the nature of their ore. The result of chlorination tests, made by Mr. Williams several months since on Raymond & Ely ore, gave 85 per cent. of the silver in the form of chloride.

Some little work has been done during the summer in *Timber Mountain* and *Chief districts*. The former lies north of Yellow Pine district. The Little Johnnie, a galena mine, was prospected by the Elgin Company, which has also resumed operations with sixteen men in *El Dorado Cañon district*, where, it is reported, they intend to erect a new mill. *Chief district* is situated twelve miles south of Pioche, and three miles west of Meadow Valley. Work has been commenced on the Black Hawk ledge by Messrs. Raymond & Co. The ore extracted is estimated to be worth \$100 per ton.

BORAX, SODA, AND SALT DEPOSITS.

The following is extracted from a letter sent from "Sink O'Carson," Churchill County, Nevada, prepared by H. Degroot, and published in the San Francisco Evening Bulletin, April 24, 1872:

Borax.—There are in this vicinity several extensive beds of borax, the principal one being near Sand Springs, about fifty miles east of Wadsworth. There are at this point over a thousand acres covered with the borates of lime and soda; and although the deposits are not so heavy here as at Fish Lake and Columbus, they are, nevertheless, very ample, and can be gathered at little cost. Works having capacity to manufacture nearly one ton of marketable borax per day have lately been put up on the ground, and are being run with success and profit. On an alkali flat, twenty miles southwest of the above locality, the borates also occur in considerable quantities, as well as near the Hot Springs, nineteen miles northeast of Wadsworth. This crude material, being so abundant and lying so convenient to the railroad, will yet become a source of much wealth to this region of country.

Soda and salt.—These also occur in incredible quantities and very pure form in this part of Nevada. Situate near Sand Springs is a salt-bed covering several hundred acres; and in Great Salt Valley, fifty miles north of that place, another of much larger dimensions. From the former the Washoe mills obtained their supplies of salt for a number of years. Now, however, they procure this article in part from San Francisco, and in part from a bed lying sixteen miles northeast of Wadsworth and close to the railroad.

Two miles northeast of Ragtown exists a remarkable deposit of the carbonate of soda. It lies in the midst of a dismal sage heath, in a circular valley, about one-third of a mile in circumference, its bottom depressed 50 feet below the surface of the surrounding plain. In ordinary seasons this basin remains dry, though covered sometimes with a foot or two of water. The bottom is a solid mass of the carbonate of soda, hard, white, and sufficiently pure to answer most of the purposes for which this article is usually employed. This soda occurs in strata about a foot thick, separated from each

other by seams of clay half an inch thick. The deposit is worked after the manner of an open quarry, the soda being broken out in blocks and piled up on the inner side of the basin, where several hundred tons of it lie corded up. This substance has been excavated to a depth of about 30 feet without any signs of approaching the bottom. The owner of this deposit having supplied the millmen of Washoe and the soap-makers of Reno with soda, will hereafter ship the article to San Francisco, where it can be delivered at a cost of not more than \$20 per ton, all expenses included.

A few hundred yards to the northeast of this soda-quarry is a lake, about one and a half miles in circumference, the water of which is supersaturated with salts of various kinds, a large proportion being borax. This lake, which occupies an oval basin, lies 150 feet below the level of the plain, the banks shelving down with as much symmetry as if shaped by artificial means. The water of this lake is impregnated with soluble substances, mostly borax, soda, and salt, to a degree that renders it fairly slimy, and so dense that a person can float on it without effort. Bathing, however, is attended with unpleasant consequences, the water causing a smarting of the flesh if one remains in it for more than a few moments. This lake has no visible outlet or inlet, but, being of great depth, is probably fed by deep seated springs.

A few years ago a scheme for the production of borax was attempted here by some San Francisco parties, the plan being to pump up this water and carry it in troughs out upon an alkali flat, lying a quarter of a mile away, there to be evaporated, when it was supposed this valuable salt would be left in the form of a deposit behind. The enterprise failed of success, partly because it was inherently defective, but chiefly because extensive beds of the borates were soon after discovered in the country adjacent. The buildings erected for housing the machinery and workmen still stand on the shore of the lake, solitary and tenantless, adding, if possible, to the lonely and desolate appearance of the place.

Eagle Salt-Works, Humboldt County.—These works* are situated in an oblong basin surrounded by basaltic hills, nearly equally distant from the Humboldt and Carson sinks, and Pyramid Lake, being about twenty miles from each. It receives the drainage of about three hundred square miles. The basin was formerly known as the Truckee Desert. Its general direction is northeast and southwest, and its flat or central portion is about one mile and a half wide by twelve miles long, and entirely destitute of vegetable life. The Central Pacific Railroad skirts the northwestern side, about one mile from the salt-vats.

The salt-deposit is similar in character to those which are so widely distributed through the desert portion of the Inland Basin. It was discovered in March, 1870, by Mr. Lute, during a trip of more than two thousand miles, undertaken with a view of exploring for salt, in the course of which he calculates that he visited at least a million acres of salt-lands. The ground was located early in the same year, (under the Nevada statute of February 24, 1865, entitled "An act to provide for the location of lands containing salt,") by twenty-two citizens, each claiming 160 acres. The basin lying in unsurveyed public lands, no Government title was obtained; indeed, there exists no special provision in the United States law for deposits of this character, unless they can be located and patented under the "placer law." Since the commencement of operations the company has been steadily engaged in developing the property, employing from ten to thirty-five men and twelve to twenty draught horses.

From July 1, 1871, to June 30, 1872, the company marketed 25,832 bushels of mining-salt, and 2,202 bushels of table and dairy salt. Mining-salt cost 21 cents per bushel, and was sold at 28 cents; table and dairy salt cost 31½ cents per bushel, and was sold at 42 cents. Operations were interfered with, during the year, by a water-spout, on the night of July 18, 1871, which flooded the works, ruining about 2½ acres of vats, and destroying an estimated quantity of 70,000 bushels of salt. Precautions have been taken to prevent similar disastrous results in future.

* This description is taken from a manuscript of Mr. B. F. Lute, kindly put at my disposal by Mr. E. S. Davis, surveyor-general of Nevada.

Mode of manufacture.—On the portion of the lands thus far improved salt-springs are found, from $2\frac{1}{2}$ to 4 feet below the natural surface, furnishing when opened a saturated brine. This is evaporated in rectangular vats or ponds, formed by removing from 2 to 4 feet of the top earth with plows and scrapers. These vats are usually laid out to contain one-fourth of an acre each, and sunk to such a depth as to gather by natural seepage about 4 inches of brine, which is then crystallized by solar evaporation.

The largest consumers are the silver-mills, for the use of which the salt is gathered with hoes, shovels, and wheelbarrows, and shipped without particular care to keep clean. For table and dairy purposes the clean crystals are taken with great care, dried, and reduced to flour in a burr-stone flouring-mill, and sent to market in convenient packages.

The following analysis, made by Mr. W. C. Bonsfield, of Virginia City, in June, 1870, shows the quality of the fine salt here manufactured :

	Per cent.
Chloride of sodium.....	99.38
Sulphate of soda.....	.13
Sulphate of magnesia, with trace of lime.....	.03
Water.....	.46
	100.00

The consumption of salt by the stamp-mills of Nevada, in the reduction of silver-ores, is not less than 10,000 tons per annum.

CHAPTER III.

IDAHO.

I have been able this year to pay more attention to the developments of this Territory than the meagerness of my means permitted me to bestow in former reports.

Besides Mr. J. M. Adams, who has again furnished me with very full statistics on the Owyhee mines, covering the time from July 1, 1871, to December 31, 1872, Mr. A. Wolters, assayer of the United States assay-office at Boise City, has been secured as a contributor to my report, and my deputy, Mr. A. Eilers, has visited and reported upon the new lead-silver mines of South Mountain district.

The bullion product of the Territory, as will be seen from the general account following, has fallen off to a large extent. The exhaustion of the placers is not the only cause of this decrease. It is partly due to the development of other mining regions by the great facilities of railroad communication, and the consequent activity of operations in those regions, which has attracted large numbers of miners from the fitful employment of gulch-mining to the more steady occupation furnished the year round by the regular industry of quartz-mining. To this must be added the effect of a very bad year at the silver-mines of the Owyhee.

The product of the Territory in 1872 is estimated as follows, on the basis of the express shipments:

Gold by express	\$1, 817, 809
In private hands	454, 452
Silver by express	423, 609
Total	2, 695, 870

A comparison with the estimates of the reports of United States commissioners in former years will show how great has been the recent annual decline. Those reports give the following figures:

1864	\$6, 474, 080	1869	\$7, 000, 000
1865	6, 581, 440	1870	6, 000, 000
1866	8, 023, 680	1871	5, 000, 000
1867	6, 500, 000	1872	2, 695, 870
1868	7, 000, 000		

Owyhee district.—The Golden Chariot mine, as shown by the annexed statements, has been in low-grade ore for the last eighteen months. In the last two months, however, they have sorted the ore closely, and it is now paying about \$36 per ton. They have straightened their shaft, (really a new one,) as the old one was going away from the vein, being about 100 feet away at the bottom. So a new shaft has been sunk, striking the vein at the ninth level. The mine is improving gradually under careful and economical management.

The low yield of the slums and tailings shows the average low grade of ore worked, and the past year has been one of assessments.

In the Poorman all the ore has been taken from old dumps and old stulls, and has paid well, as the expense was little.

In the Oro Fino, I regret to say, the ore has not held up well. There

is always a good vein, but rarely much pay-ore. Much of the product came from old stulls. At present it is closed down.

The War Eagle mine is a soft vein, easily worked, and the last runs paid very well. The mine looks well to-day, but debts having been allowed to accumulate too much before assessments were levied, there was trouble with the miners, and the mine is now temporarily closed.

The Empire mine is a strong 3-foot vein of hard quartz, in places very rich. The returns have disappointed all, and there is now an assessment on it. But in the last week they have struck very rich ore, a 4-foot vein assaying \$100 to \$125. It was first struck 300 feet north of the shaft, on the second level; there a splice or fault was found. The ore beyond still continues rich. Meantime in the first level they have also struck the same ore, and also in the third level. The character of the ore and of the fault are alike in the three levels, and all indications are favorable for the existence of a large body of good ore. This fault is a seam, crossing the vein nearly at right angles, and running obliquely from 300 feet north of the shaft in the second level, toward a point much nearer to the shaft in the third; and, as it has been so very regular so far, it may be expected to be found still nearer to the shaft in the fourth level. For 60 feet before striking the rich ore there was a pay-vein 20 inches wide.

The South Oro Fino, bought by the Ida Elmore Company, proved a disappointment, like the main Oro Fino.

The Ida Elmore, after a long period of almost hopeless prospecting, is at last giving promise of a heavy body of ore in depth. It has just been reached on the ninth level, and it is hoped that the mine will produce more bullion in the next twelve months than is now produced by the entire camp.

The South Chariot has made little or no returns lately, but is being well opened, and lately has been developing a very promising body of ore.

The Red Jacket, after having lain idle for several years, has been reopened with very flattering prospects, and lately they have found a very rich body of ore, in places 8 feet wide. If continuous it will be the best mine of the camp. It has lately been incorporated in San Francisco.

The Minnesota has lately given indications of good ore, but it has proved so far to be only in spots, and much barren rock has been taken out to get a little pay-ore.

The Mahogany mine, after some bad management, has, for the last few months, been managed by a first-class superintendent. He has gradually worked the mine out of debt, and now it is the only mine that has money ahead to any extent. The mine is looking remarkably well throughout.

The Pauper and Morning Star are both closed down for the present, though showing very rich ore where work was stopped. They will probably start up in spring.

In Flint district the Rising Star mine is being opened very quietly but steadily, and next season probably will make a showing. The other ledges there are worked spasmodically. There is no material change in the placers, but much money has been taken out of which there is no record.

No. I.—Statement of product of mines in Owyhee County, Idaho, from July 1, 1871, to January 1, 1872.

[Reported by John M. Adams.]

Name of mine.	Worked at—	Tons of ore.	Total tons of ore.	Product.	Total product.	Yield per ton.
Golden Chariot	Owyhee Mill	3,155	4,405	\$72,666	\$111,487	\$19 30
	Cosmos Mill	900		26,595		29 11
	Ida Elmore Mill	100		7,400		74 00
	South Chariot	250		4,826		19 30
Slums and tailings	Owyhee Mill	639	639	8,059	8,059	12 61
Poorman	do	567	567	12,043	12,043	21 24
Oro Fino	do	1,166	1,166	46,700	46,700	40 00
War Eagle	do	570	570	15,136	15,136	26 55
Empire	Cosmos Mill	80	80	9,270	9,270	116 00
Prospecting	Arrastras	200	984	16,000	56,623	80 00
	Cosmos Mill	284		25,000		116 75
	Webfoot Mill	500		15,623		31 25
South Oro Fino	Ida Elmore Mill	1,000	1,000	13,000	13,000	13 00
Ida Elmore	do	219	219	6,570	6,570	30 00
Minnesota	do	612	612	18,360	18,360	30 00
Mahogany	do	1,350	1,350	20,135	20,135	15 00
South Chariot	South Chariot Mill	250	250	10,414	10,414	41 65
Flint District	Black's Mill	68	68	10,810	10,810	159 00
Placers					56,000	
Total			11,910		394,607	

No. II.—Statement of product of mines in Owyhee County, Idaho, from January 1, 1872, to December 31, 1873.

[Reported by John M. Adams.]

Name of mine.	Worked at—	Tons of ore.	Total tons ore.	Total product.	Yield per ton.
War Eagle	Owyhee Mill	1,950	1,950	\$47,863	\$29 70
Oro Fino	do	2,262	2,262	39,243	17 35
Morning Star	do	41			
Poorman	Cosmos Mill	40	81	4,904	60 54
	Owyhee Mill	920	920	11,740	12 76
Empire	do	1,924	2,280	55,394	24 30
	Cosmos Mill	250			
	Ida Elmore Mill	106			
Pauper	Owyhee Mill	113	113	3,484	30 83
Slums and atilings	do	1,425	3,450	25,453	7 37
	Ida Elmore Mill	2,025			
Minnesota	Owyhee Mill	100	1,100	42,106	38 27
	Cosmos Mill	350			
	Ida Elmore Mill	450			
	South Chariot Mill	200			
Golden Chariot	Owyhee Mill	934	1,651	34,374	20 82
	Cosmos Mill	40			
	Ida Elmore Mill	677			
Prospecting	Owyhee Mill	5	578	28,020	48 47
	Cosmos Mill	387			
	Ida Elmore Mill	186			
	Cosmos Mill	196			
Mahogany	Ida Elmore Mill	638	1,834	73,100	40 00
	South Chariot Mill	1,000			
	Ida Elmore Mill	1,018			
South Oro Fino	do	560	560	14,150	13 90
Ida Elmore	do	560	560	25,915	46 27
Red Jacket	do	76	76	3,040	40 00
Flint district	Black's Mill	53	53	8,000	151 00
Placers				38,371	
Total			17,926	455,157	

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No. III.—Statement of ore worked by mills in Owyhee County, Idaho Territory, from July 1, 1871, to December 31, 1871.

[Reported by John M. Adams.]

Name of mill.	Number of tons of ore.	Total tons per mill.	Mine.	Product.	Yield per ton.
Owyhee.....	3,155 639 567 1,166 570	6,097	Golden Chariot.....	\$72,666	\$23 00
			Slums and tailings.....	8,059	12 61
			Poorman.....	12,043	21 24
			Oro Fino.....	46,760	40 00
			War Eagle.....	15,126	26 55
Cosmos.....	900 80 284	1,264	Golden Chariot.....	26,595	29 11
			Empire.....	9,270	116 00
			Prospecting.....	25,000	116 75
Ida Elmore.....	1,000 219 612 1,350	3,281	South Oro Fino.....	13,000	13 00
			Ida Elmore.....	6,570	30 00
			Minnesota.....	18,300	30 00
			Mahogany.....	20,135	15 00
			Golden Chariot.....	7,400	74 00
Arrastras.....	200	200	Prospecting.....	16,000	80 00
Webfoot.....	500	500	Prospecting.....	15,623	31 25
South Chariot*.....	250	500	Golden Chariot.....	4,826	19 30
	250		South Chariot†.....	10,414	41 65
Black's.....	68	68	Prospecting‡.....	10,810	159 00
Placers.....		11,910		56,000	
Total.....	11,910			394,647	

* Formerly Sinker Mill.

† Formerly Peck & Porter mine.

‡ Flint district.

No. IV.—Statement of ore worked by mills in Owyhee County, Idaho, from January 1, 1872, to December 31, 1872.

[Reported by John M. Adams.]

Name of mill.	Number of tons of ore.	Total tons per mill.	Mine.	Product.	Yield per ton.
Owyhee.....	1,950 2,262 41 920 1,924 113 1,425 100 934 5	9,674	War Eagle.....	\$47,863	\$29 70
			Oro Fino.....	39,243	17 35
			Morning Star.....	2,404	58 63
			Poorman.....	11,740	12 76
			Empire.....	38,840	20 19
			Pauper.....	3,484	30 83
			Slums and tailings.....	9,841	6 90
			Minnesota.....	5,000	50 00
			Golden Chariot.....	14,800	15 84
			Prospecting.....	300	60 00
Cosmos.....	196 350 250 40 40 387 106 186 450 1,018 2,025	1,263	Mahogany.....	7,200	36 74
			Minnesota.....	10,482	30 00
			Empire.....	5,020	25 00
			Golden Chariot.....	983	24 60
			Morning Star.....	2,500	62 50
			Prospecting.....	19,350	50 00
			Empire.....	11,534	109 00
			Prospecting.....	8,370	45 00
			Minnesota.....	19,124	42 22
			South Oro Fino.....	14,150	13 90
Ida Elmore.....	560 638 677 76 200	5,736	Slums and tailings.....	15,612	7 78
			Ida Elmore.....	25,915	46 27
			Mahogany.....	34,900	54 70
			Golden Chariot.....	18,591	27 46
			Red Jacket.....	3,040	40 00
South Chariot.....	1,000	1,200	Minnesota.....	7,500	37 50
			Mahogany.....	31,000	31 00
Black's.....	53	53	Flint district.....	8,000	151 00
Placers.....				38,371	
Total.....		17,926		455,157	

South Mountain district.—The discovery of mineral-deposits and the organization of a new district at the South Mountain, twenty-five miles due south of Silver City, were briefly mentioned in my last report. But I could not, at that time, obtain accurate information as to the real merits of the new mines, and the district was therefore visited in the fall by Mr. Eilers, who reports as follows:

South Mountain is a range much lower than the Owyhee Mountains; it is situated south of the latter, and its main axis runs approximately parallel to that of the Owyhee, *i. e.*, northwest and southeast. There is, however, no connection between the two, either topographically or geologically, as some maps of Idaho give it. Traveling the direct route from Silver City to the new mining-camp in the South Mountain, crossing the southern part of the Owyhee Mountains, and descending to the Flint district, the South Mountain is continually in sight of the traveler. So far the road leads over granitic rocks. A few miles south of Flint district a table-land of basaltic lava, cut up into deep cañons by every little brook, is entered. The lowest part of this table-land is occupied by Trout Creek, which, running east and west, has cut a cañon into the lava of probably 500 feet in depth. Emerging from this the plateau gradually ascends, until, at a distance of about six miles from the creek, the first foot-hills of the South Mountain are reached. These consist also of lava, but the next higher ones are granite, a rock which forms entirely the northern slope and the body of the northern ridge of South Mountain proper. In traveling over the plateau the entire northern slope of the mountain is continually in full view. It is covered with a park-like forest of pines, stretching away to the right and left for many miles, which promises an abundance of fuel for many years. The plateau, as well as the mountains, is covered thickly with grass, and many small creeks leave the mountain on this side, wending their way through cañons, getting deeper and deeper toward Trout Creek. The new mines are located directly over the first ridge, locally called the "Rail ranch," in the deep cañon southwest of it. The route described is the nearest from Silver City, and supplies can be brought by it up to the top of the first ridge. The descent into the cañon beyond is, however, so steep that no road appears practicable without extraordinary outlay, not warranted at this time, and everything is therefore packed from here into camp. Nearly three-fourths of the southwestern slope of this ridge are composed of granite; lower down crystalline white limestone adjoins the granite. It underlies, together with comparatively thin layers of mica slate, the lower part of the slope just spoken of, the narrow valley, and the mountain on its southwest. Beyond it is again joined by granitic rocks. In the belt of metamorphic rocks, on both sides of the valley just mentioned, and principally toward its head, occur the mineral-deposits, which have caused the organization of the district. A direct communication with the Central Pacific Railroad has been secured by making a road from the mining-camp, where a town-plot, called Bullion City, has been laid out, by way of the head of the cañon, to old "Camp Three Forks," six miles distant. From this site of a former United States fort a good military road, forty-two miles long, leads to Camp McDermott, which lies on the present stage-route from Winnemucca to Silver City, and is eighty miles distant from the former place. The distance of the new mines from the railroad by direct route is therefore one hundred and twenty-eight miles.

Mineral was first discovered in these mountains about three years ago. It was gold, occurring in small veins, and the ore was poor. So

the discovery was not followed up. In the fall of 1871, another set of prospectors visited South Mountain, and at this time most of the veins carrying argentiferous lead-ores were located. I say "veins," because the course of the mineral deposits appears to be different from that of the country-rock, and because they seem to occupy more or less regular fissures. But I am by no means certain in this regard, as the soil and vegetation which covers the rock everywhere prevent the following of the mineral for any distance, and the explorations thus far made on the various locations comprise in most cases only shallow shafts or short tunnels on the course of the deposits.

The Original is located high up, near the head of the cañon, on its northeast side. It is a large deposit of quartzose, slaty, iron-stained rock, which, in a cross-cut tunnel 45 feet in, shows here and there weak streaks of carbonate of lead and carbonate of copper. The average value of the whole mineral matter was given me by Mr. Von Liebenan, a resident metallurgist, as about 6 per cent. of lead, and \$4 to \$6 per ton of silver. The cross-cut tunnel above mentioned does not penetrate the whole of the mineral matter. Besides this there are several other tunnels and prospecting cuts, arranged in a planless manner, none of which show anything encouraging.

The Golconda.—This claim was located on September 6, 1871. It is near the Original, and a little lower down the cañon, on the same mountain-side. The work done on it, consisting of a tunnel and a shaft from the sole of the tunnel, shows this to be a vein. It runs northeast and southwest, as shown in the tunnel, which is run in along one wall for 57 feet. The width of the vein is here 8 feet, and it is well filled with carbonate of lead and galena, the gangue being quartz and some calc-spar. The walls are crystalline limestone. At the end of the tunnel the workmen pierced a cross-vein of barren quartz, lying between the crystalline limestone mentioned on the hanging wall and mica-slate on the foot-wall, which inclines strongly toward the mouth of the tunnel. There is no continuation of the lead-vein, in the same line, beyond the mica-slate, and work was stopped here, probably under the impression that this was the end of the vein in that direction. But the surface shows, some 8 or 10 feet to the right of the tunnel end, that the continuation of the vein must be looked for in that direction, and that we have here a well-developed fault in the vein. Near the mouth of the tunnel a shaft, 60 feet deep, has been sunk in the vein. At a depth of about 80 feet this shaft must strike the continuation in depth of the stratum of mica-slate, which cuts off the vein in the tunnel above, providing it retains the dip which it shows at the end of the tunnel. The croppings to the right of the fault mentioned above can be traced some 600 feet up the mountain side. There is considerable ore exposed by means of the tunnel and shaft, and a pile of about 75 tons is on the dump. It is reported to assay from \$40 to \$60 per ton in silver, and 34 per cent. of lead. The galena assayed separately assays much higher. There is little iron in this ore, and as considerable quartz is mixed with it, an iron plug is required for smelting, which is furnished by other mines in the district. This mine has been bonded for \$60,000 until the middle of November. It was offered by the bondholder to San Francisco parties, I am informed, for \$200,000; but the expert sent to the mine by them was unable to see as high a value as this exposed, and very properly advised against the purchase at the price asked. The net value of the ore in sight and out was not in the most favorable case more than one-sixth of the amount asked.

The Crown Point is located on the hill opposite the Golconda and a

little lower down the cañon. It was discovered in the spring of 1872, and is now opened by an incline on the vein 35 feet deep. It runs north-east and southwest, dips northwest 30° , and is shown to be about 5 feet thick. On and near the top the ore was decomposed and soft, but at the depth above named it is galena and zinc-blende in hard quartz. It cannot be smelted economically without sorting and dressing nearly the whole of it. Assays show the assorted ore to contain from \$50 to \$60 of silver per ton, and from 30 to 40 per cent. of lead.

Lower down the cañon, at the site of Bullion City, a fork comes into the valley from the west. The mountain north of this fork, and northwest of the main cañon, contains a number of veins in limestone and mica-slate, which differ from those already described in the composition of nature of the minerals they contain. The ore is heavily stained with iron, and is so far, with the exception of ribs and large lumps of galena, soft and workable with the pick alone. Most of the lead is present as carbonate, with the exception of one mine, in which galena and carbonate are present in about equal quantities. Commencing from the angle made by the main and side cañons, and going down the main cañon, the first is—

The Cottonwood.—This is a heavy body of iron-ore about 10 feet thick, on which an incline 63 feet deep has been sunk. The ore is partly yellow and ochrous, partly brown, and very soft. Nests of carbonate of lead have been found in it, but the average is poor in lead and silver. Yet the possession of this deposit is of considerable importance to smelting-works, which may smelt the ores of the district, as it offers a flux for quartzose ores at once well adapted and cheaply obtainable. The strike of the vein is nearly east and west, and its dip, with somewhat varying angle, to the south. There are 1,400 feet in the location.

The Independent is located on the top of the same hill. It runs also east and west, and dips south. A shaft 60 feet deep is sunk here, which is for the first 25 feet in good, almost solid gray carbonate of lead. This is 2 to 3 feet thick, and by its side run 8 to 15 inches of iron-stained carbonate. At the depth of 25 feet the ore-body, however, leaves the shaft, "sliding" to one side, and the shaft continues straight on in limestone. The ore-body has been followed for a short distance only along the limestone floor. There is excellent ore on the dump, which assays from \$50 to \$80 in silver, and 30 to 45 per cent. of lead. The location is 1,200 feet long.

Bay State.—Following along the hillside down the cañon for a short distance the Bay State is reached. It seems to run about east and west, and stands nearly perpendicular. On the top the vein is cross-cut to make room for starting the shaft. Here nearly 3 feet of splendidly pure galena are exposed, and several streaks of carbonate of lead. The shaft is 30 feet deep. In its bottom carbonate of lead with iron-ore preponderates, but there are many streaks and lumps of galena in it. I was informed that the galena assayed over \$200 in silver, and that the average of galena and carbonate from the bottom yielded \$80. I took samples for assay from this vein, which I shall mention hereafter. The location is 1,200 feet long.

Yreka.—This is located lower down the cañon, runs east and west, and dips about 60° south. There is an inclined shaft on it which shows the deposit to be 8 feet thick. The ore is iron-stained carbonate, with some galena, which assays from \$30 to \$40 per ton in silver. The ore must be assorted for smelting. The claim includes 1,400 feet.

The Rose is a location of 800 feet in length, which has been opened very recently. The cross-cut shows two streaks of iron-ore, carbonate

of lead, and some galena. The latter is reported to assay over \$300 per ton in silver.

The Grant is the lowest location now opened in the cañon. It is 1,200 feet long and lies in a slaty limestone. It runs northeasterly and southwesterly, and dips northwest. A shaft 60 feet deep was sunk on it in the fall, which has since been deepened to 100 feet. The ore was at the time of my visit from 3 to 7 feet thick, and consisted of iron-stained carbonate of lead, in which were lumps of undecomposed galena. In the lower part of the shaft there was a streak of 3 to 6 inches of black manganese nearest to the foot-wall. The average of the ore was reported to me by Mr. von Liebenan to assay from \$60 to \$80 per ton in silver. Samples taken from it by myself assayed as given hereafter. There were about 130 tons on the dump at the time of my visit.

All the other mines above mentioned had from 30 to 50 tons of ore on their respective dumps. Besides the above, there are several other locations, which are, however, too little opened to merit mention.

A company has been formed in Silver City, which was to raise \$10,000 for the purpose of erecting a blast-furnace to smelt the ore from these mines. Work was commenced at the district when about half the capital was subscribed. The company bought a saw-mill second-hand, and an old engine to furnish the power. At the same time the construction of the furnace was commenced; but the money really paid in soon gave out, and no more could be obtained. With the greatest difficulty the furnace, a rectangular shaft-furnace with three tuyeres, was so far completed that a trial-smelting could be undertaken in November, which, however, was unsuccessful. As the principal reason given is that the dilapidated condition of the steam-engine necessitated such frequent stoppages that the proper heat could not be maintained in the furnace, several other attempts were made, but none were successful, and at the latest accounts, received in December, the works and most of the mines were lying idle.

The following assays, made of samples which were personally taken from two of the mines of this district, will serve to show that in all probability, as far as judgment is possible at the present time, the district offers, in these two, at least, the basis of a remunerative enterprise :

Name of vein.	Kind of ore.	Lead, per cent.	Gold, per ton.		Silver, per ton.		Total value in gold and silver.	Remarks.
			Ounces.	Dollars.	Ounces.	Dollars.		
Grant.....	Carbonate and galena.	20	0.5	10 33	44.5	57 54	67 87	Average across the lode at bottom of shaft.
Do.....	Yellow carbonate and galena.	40	0.25	5 17	96.75	125 08	130 25	From hanging wall.
Do.....	Solid gray carbonate and galena.	33	0.4	8 27	277.4	358 65	366 92	From middle of vein.
Do.....	Galena	48	0.3	6 20	182.9	236 47	242 67	From near foot-wall.
Bay State.....	do	67	0.25	5 17	208.65	269 76	274 93	From near the top.
Do.....	Galena and gray carbonate.	61	0.35	7 23	172.55	223 09	230 32	Do.
Do.....	Yellow and gray carbonate.	28	0.5	10 33	28	36 20	46 53	From 10 feet down the shaft.
Do.....	Mixture of carbonates and galena.	30	0.3	6 23	58.2	75 25	81 48	Average across the vein.

There are several deposits of fire-clay in the vicinity of the new camp, but no fire-proof rock better than a very quartzose granite had been

found up to the end of this year. The furnace was therefore lined with the granite mentioned. I am not informed as to its merits as determined by the trial-smelting.

The following statement of prices for labor and materials has been furnished by Mr. Charles von Liebenan.

Statement of prices at South Mountain district, Owyhee County, Idaho.

Wages of miners.....	\$4 per day.
Wages of smelters.....	4 50 per day.
Wages of wood-choppers and coal-burners	65 to \$75, and board, per month.
Wood	4 per cord.
Charcoal in small quantities.....	22 to 25 cents per bushel.
Transportation to railroad, by way of Trout Creek	35 per ton.
Transportation to railroad, by way of Camp Three Forks.....	25 per ton.

Castings are made in Silver City, twenty-five miles distant, for ten cents per pound.

Up freight from Winnemucca has, so far, been from 3 to 3½ cents per pound. But this is expected to become much cheaper as soon as a regular trade is commenced. Sinking, by contract, \$10 per foot, (4 by 8 feet.)

Cattle and horses are cheap in the vicinity, and provisions are not very high, as much grain, &c., is raised in the valleys to the north, especially along Trout and Jordan Creeks, the Owyhee and Boise Rivers.

Three miles southeast from Bullion City, over the ridge, occur several very large veins of almost solid arsenical and iron pyrites, which contain small amounts of gold and copper. They are not opened, and at present of no value.

The prospected portion of South Mountain is a very small part of the range, but the mineral deposits found so far are sufficiently important to promise some prominence as a producing mining-district to the region.

MIDDLE AND NORTHERN IDAHO.

A large part of these sections of the Territory was visited during last fall by Mr. A. Wolters, to whom I am indebted for extensive notes. Mr. Wolters acknowledges valuable assistance rendered and courtesies shown him, during the prosecution of his work, by Mr. R. Hurley, of Idaho County, Mr. Mootry, of Placerville, Mr. Huffacker, of Atlanta, and Dr. Belknap, of Boise City.

While mining affairs in nearly every State and Territory have been steadily improving, those of Idaho, though unsurpassed by any of her sisters in mineral resources, are constantly declining. This is partly owing to the general exhaustion of the placer-diggings, but principally to the absence of facilities for cheap transportation, which makes quartz-mining unprofitable in many cases, by causing high prices of provisions, mining implements, and labor.

The yield of the once famous placer-claims of the Boise Basin and Northern Idaho, which footed up from seven to ten millions per annum up to 1868, has ever since decreased, until for this year the whole bullion product of the Territory has fallen off to less than three millions,

though an abundance of water rendered the last season a very good one. Probably two-thirds of all the claims now worked are in the hands of Chinese, and yield only from \$3 to \$4 per day to the hands. The white population has correspondingly decreased, and the amount of taxable property gets less every year. Owyhee and Lemhi Counties are even asking for annexation to Nevada and Montana respectively, and to every unprejudiced mind it must be evident that, if this state of affairs is permitted to go on much longer, Idaho in a few years hence will probably have almost ceased to be a bullion-producing country. It is true that new deposits of placer-gold may be discovered yet, but, as the Territory has been thoroughly overrun and searched in all directions by numerous parties of prospectors, we are not justified in looking for the discovery of very extensive and rich diggings. The future of Idaho as a mining country solely and undoubtedly rests on her vast deposits of rich gold and silver bearing quartz and base metals.

Mr. Wolters, who has made quite an extensive tour through the middle portion of Idaho, though not having been able to personally visit all the quartz-mining camps, declares that he is convinced that the mineral resources of Idaho are second to those of no other mining country, and that, if only a little more energy had been displayed in their development, and a few hundred thousand dollars had been legitimately expended in building good wagon-roads, and erecting proper reduction-works, Idaho would not now be surpassed by Colorado and Utah.

So far the owners of even the very best lodes have had to contend with a great many serious difficulties, especially in the northern part of the Territory. Since 1862, when the first quartz-mining began here, hundreds of the most valuable gold and silver-bearing lodes have been discovered, but, with a few exceptions, work has been discontinued on all of them a long time ago. The northern counties, as well as Limhi, are not connected by wagon-roads with either the Pacific Railroads or the Columbia River, and everything has to be packed in for long distances on rough mountain-trails. To bring large reduction-works into these districts is impossible, from the simple reason that part of the machinery is too heavy to be packed on two mules, and, even if this could be done, the cost would be enormous, and entirely out of proportion to the inducements offered. A 10-stamp mill, for instance, erected at Warren's Camp, has cost over \$25,000, and, as nearly all the owners of mines are workingmen and poor, they cannot, even by co-operation, raise the necessary means to secure reduction-works.

The owners of the several small mills now existing can supply them with the ore from their own mines; and, owing to this, they do not care to do any custom-work. Their charges are therefore so high that they are largely in excess of the average yield of the ores. Thus the miners have no market for their ore; and, as they cannot afford to work or develop their mines without immediate returns, a large number of lodes carrying from 1 to 3 feet of ore, which mills from \$20 to \$50 per ton, are lying idle. Thus mining-camps become deserted, which, with a moderate amount of capital judiciously expended in the construction of roads, in the opening of the prominent lodes, and the erection of suitable reduction-works, would, within a few years, yield large returns. The worst obstacle in the way of removing these difficulties is, of course, the entire absence of railroad facilities in the Territory. Capitalists, who want to invest money in mining, will hardly go to a country where they have to travel hundreds of miles on horseback, or in not over-comfortable coaches, in order to reach the nearest railroad station. Such a trip

involves considerable loss of time; it requires the undergoing of hardships and annoyance, and this alone is sufficient to induce many to go to other districts which can be reached by rail, though the mines there may not be at all equal to the remoter ones. The main point, though, is that the absence of railroads is always a sure indication of high rates for freight, wages, and materials, and that it requires extraordinarily good mines to yield a profit under such circumstances. It is therefore evident that Idaho cannot expect to secure a market for her ores unless she secures railroad facilities. That this fact has not been realized before is certainly strange; and even now the conflicting special interests of the different counties seem to prevent a combined effort to induce capitalists to come to the rescue in this respect. Two bills were introduced in the legislature to grant territorial aid to the construction of the Portland, Dalles and Salt Lake Railroad, and to a road from some point on the Central Pacific to Boise City. Neither of the bills, however, passed; Owyhee Company opposing the Portland, Dalles and Salt Lake Railroad; Oneida and Alturas the other one, and the delegates of the northern counties voting as a unit against both. After much exertion a bill was finally passed exempting all railroads built within the limits of the Territory from taxation for the next seven years; but it remains to be seen whether this, in the absence of land-grants, will be considered a sufficient inducement by capitalists. It is further reported that the Northern Railroad Company find that the original line fixed upon through the Territory is impracticable, and that they will change their route so as to go either along the Salmon or the Snake River. A corps of engineers has been surveying all summer along the former, but nothing positive has been decided upon so far.

The local facilities for quartz-mining are very good in all the different districts. The mountains abound in the most magnificent timber; the valleys, where no placer-mining has been done, have splendid soil, and yield good crops. Good pastures and ample supply of water are also met with throughout the mining sections, and the steep mountain-sides afford splendid chances for deep tunnels to drain the mines. In short, all that is needed to bring back the days of former prosperity in Middle and Northern Idaho is cheap transportation and a market for the ores.

The placer-mines in Northern Idaho are to the greatest extent worked out and in the hands of Chinamen. In the once famous camp of Florence there are now only two associations of white men at work. In Warren it is not much better, and I feel satisfied that \$500,000 will cover the whole gold product of Idaho, Nez Percés, Shoshone, and Lemhi Counties for this year. The yield of the principal and most productive camps, as furnished to me by Mr. R. Hurley, county treasurer and assayer at Warren's, is as follows:

Florence.....	\$78,000	Elk City.....	\$40,000
Warren's.....	56,000	Newsome Creek.....	30,000
Oro Fino.....	70,000	Salmon River.....	} 40,000
Clear-Water Station.....	50,000	Snake River.....	
		Total.....	364,000

The product of Leesburg and Loon Creek in Lemhi County I have not been able to ascertain.

Quartz-mining has so far received very little attention in Lemhi, Nez Percés, and Shoshone Counties. In the latter large masses of float-rock have been found, assaying from \$50 to \$70 in gold; but all endeavors to find the lode or lodes from which the rock came have so

far been unsuccessful. From Lemhi Mr. Wolters has received several pieces of good galena, assaying very high in gold and silver, but nothing has been done as yet to actively develop any of the lodes. Only in Idaho County enough work has been done to show the character and value of the veins.

In Warren's, the center of the quartz-mining region in Idaho County, there are three different classes of lodes, one carrying gold almost exclusively, the second both gold and silver ore, and the third only silver-ore, containing little or no gold. The bearing of these lodes ranges from nearly due east and west to northeast and southwest; they dip all considerably north, carry much water, and are exceedingly well defined. The mineral-bearing gangue is quartz, and the width of the ore-veins usually varies from 12 to 36 inches. Besides the quartz there is more or less decomposed gangue-matter, closely resembling the granite, which forms the country-rock.

The representative lode of the first class, and the best developed, is the Rescue lode, which is claimed for a distance of 4,500 feet, but the development is confined to the 1,200 feet now owned and worked by G. Gambel. The discovery-shaft has reached a depth of 182 feet. Three pairs of levels have been run, at a distance of 60 feet from each other. The uppermost extends 130 feet east and 118 feet west, the second 170 feet east and 80 feet west, the ground above them being worked out. The lowest level, started from the bottom of the shaft, runs 320 feet east and 150 feet west, and from the stopes between this and the second level ore was being raised at the time of Mr. Wolters' visit. A cross-cut tunnel, 460 feet in length, and provided with a tramway, comes to the third level with the mill. A tunnel has been run in on the vein a distance of 100 feet, showing a well-defined crevice and a vein of quartz, varying from 10 to 24 inches in width, but it has been discontinued, since no greater depth could be attained by it than by the lowest level. A deep tunnel has been driven on the vein 463 feet, which will intersect the discovery-shaft about 40 feet below the third level. The distance from the mouth of this tunnel to the shaft is 1,100 feet, and if a sufficient number of hands can be procured, it is the intention to complete this tunnel by next summer and make connection with the shaft. The ground is very soft, requiring hardly any blasting at all, the crevice well defined, and a strong body of ore is exposed the whole distance. After the completion of the tunnel, the mill, now located at the mouth of the cross-cut tunnel, will be removed to the creek, some 40 or 50 feet below the mouth of the lowest tunnel. The lode runs nearly due east and west, and dips considerably north. The crevice matter is quartz more or less and decomposed granite, closely resembling the surrounding country-rock. The distance between the well-defined walls varies from 3 to 4 feet; the width of the ore-vein from 6 to 30 inches. A clay selvage from 1 to 12 inches wide is found through the whole mine. The ore is in the upper workings on the hanging-wall, and in the lower tunnel on the foot-wall. The average yield in the mill is from \$20 to \$25. A late run of thirty-seven days, comprising 480 tons, gave \$11,522.38, or at the rate of \$24 per ton. The cost of mining is stated at \$7 per ton, and of milling at \$42 per ton. The wages paid miners are \$5 per day. Lumber is worth from \$50 to \$70 per mill, powder \$12 per keg, steel 37½ cents per pound, iron 30 cents, candles \$8 per box, flour \$8 per 100 pounds.

At the time of Mr. Wolters' visit there were only six hands at work, owing to a scarcity of miners in the camp, and work was confined to stoping between the second and third levels, and extending the lowest

level east. Since then the shaft is reported to have been sunk 50 feet deeper, where a very rich body of ore was struck.

The mill erected at the mouth of the cross-cut tunnel contains 10 stamps of 500 pounds each, dropping 7 to 8 inches, and 80 to 90 times per minute. The motive-power is furnished by a 12 horse-power engine, which consumes from $1\frac{1}{2}$ to 2 cords of wood in 24 hours, worth \$4 per cord delivered. Amalgamation is effected by plates in the battery and on copper tables; the tailings pass through 125 feet of sluice-boxes provided with copper plates and blankets. The concentrated tailings will be reworked in pans. The capacity of the mill is 15 tons in twenty-four hours.

The Charity lode is being worked under a lease by a party of Cornish miners. The development on the lode consists of two tunnels on the vein, respectively 150 and 300 feet long and 60 feet apart; the crevice is $2\frac{1}{2}$ feet wide, and contains 12 inches of quartz. Nearly all the ground above the tunnels is stoped out, and it is the intention of the owners to commence forthwith a third tunnel, and extend the shaft down to it. The ore taken out now is worked in a small mill at the foot of the hill, which contains five small wooden stamps and two large arrastras, 16 or 20 feet in diameter, all driven by a 36-foot overshot water-wheel. The last lot, of 16 tons, yielded at the rate of \$26.90 per ton. A 10-stamp mill is in process of erection a short distance below the mouth of the proposed new tunnel, and as the present owners are all working men and good miners, it is to be expected that they will meet with success.

The Sampson lode.—There are two shafts on this lode, respectively 60 and 40 feet deep. The crevice is about 4 feet wide, and carries 2 feet of quartz. The richest ore is said to be in the bottom of the shaft. Two hundred tons crushed in the old water-mill yielded \$35 per ton. On the surface the ore has been taken out for a length, along the vein, of about 150 feet.

The Keystone lode, owned by Bemis & Sanderson, has a shaft 53 feet deep, connected with a tunnel, driven in on the lode for a distance of about 300 feet. The crevice is $2\frac{1}{2}$ to 3 feet wide, and contains 8 to 9 inches of ore, which is said to have yielded as high as \$75 in a stamp-mill.

The following lodes are representative of the second class of veins, carrying both gold and silver:

The Martinez lode, owned by R. Hurley and others, developed by two shafts, respectively 60 and 50 feet deep, and 60 feet apart. The crevice is 3 to $3\frac{1}{2}$ feet wide and carries 2 feet of quartz at a depth of 30 feet, and one-third of a foot at the bottom of the deepest shaft. At a depth of 25 feet a streak of exceedingly rich silver-ore comes in, and widens out to 10 inches in the bottom of the shaft. The rest of the pay-streak is gold-quartz, yielding at the rate of \$15 per ton. A great number of assays have been made from the silver-ore, all yielding from \$500 to \$8,000 per ton. As there are no works for the reduction of silver-ores, this unusually rich lode, as well as all the other good silver lodes, is lying idle.

The Hunt lode runs parallel to the former, at a distance of about 350 feet, and has a shaft sunk to a depth of 40 feet, which shows a vein of 12 inches of ore, five-sixths being gold-quartz, and 2 inches silver-ore of the same character as that in the Martinez.

The Washington lode: shaft, 20 feet deep; crevice, 5 feet wide; ore-vein 15 to 18 inches; gold-quartz on the hanging-wall; silver-ore in the center of crevice. A deep cross-cut tunnel has been started, which will intersect the lode at a depth of several hundred feet.

The third class of veins, carrying silver-ore only, with little or no gold,

is represented by the No. 1 Treasure, Laurel, and Bullion lodes, but there is no development done on them worth speaking of.

The lodes in this district are mostly narrow veins, but they are exceedingly well defined and carry a large amount of ore in proportion to their width. The ore, compared with the average value of gold-quartz in California, Colorado, and Arizona, is unusually rich. A great drawback to mining is the large amount of water encountered in all the lodes, but this is more than counterbalanced by the fact that the mountains are very steep, and as the majority of the lodes cross them there are splendid facilities for running deep tunnels in right on the vein, to drain the mine and work it very cheaply. Even the lodes not crossing the mountains are in nearly every case easily reached by cross-cut tunnels of a few hundred feet in length.

The future of this camp cannot but be a very bright one. My general remarks about the present condition of quartz-mining in Idaho apply, however, *par excellence*, to Warren's diggings.

In Florence the Harper mine, owned by Hall & Co., is the only lode which has been somewhat developed. The company were offered last fall \$3 net per ton if they would allow another party to take out 1,000 tons of ore, and the fact that they declined the offer shows that the proprietors are well satisfied of having a good mine. There are several hundred feet of tunneling and shafting done, and very little ground has been stoped out so far.

Boise County.—A great number of very promising-looking lodes occur on Granite Creek, but only a few of them are worked at present.

The Gold Hill lode, owned by the Gold Hill Company, runs northeast and southwest, dipping about 70° south. The vein-matter is decomposed granite, containing several streaks of quartz and iron pyrites, the pay-streaks varying in width from a few inches to 6 feet. The lode is opened by three tunnels. The lower one is a cross-cut for a length of 400 feet, strikes the lode at a depth of about 240 feet, and then runs along the vein 450 feet more. In this level the ore has for some time been of a rather poor character; there is, however, a better prospect now. The ground above is stoped out to the surface for a distance of about 120 feet. Two hundred feet above the cross-cut a tunnel 1,100 feet long has been run on the vein, and another one, 600 feet long, is 100 feet higher up. Out of both tunnels very rich rock was obtained, until a talcose rock appeared, which did not pay expenses, and at present there is no work going on in this portion of the mine.

The Gold Hill lode is on the northeast side of the gulch, crosses the latter, and then is known under the name of the Dunlap lode, which, for a distance of 1,600 feet, is also owned by the Gold Hill Company.

A tunnel along the vein has been lately driven on a level with the creek, and so far extended about 200 feet; 30 feet above another tunnel has been driven for a length of 600 feet. The ore-vein in the latter varies from 3 to 6 feet in thickness, in the former from 18 to 20 inches. The crevice-matter is the same as in the Gold Hill proper; the quartz-seams contain more or less antimony, and whenever the antimony becomes frequent and concentrated the quartz is invariably exceedingly rich in gold. The ground above the upper tunnel has been stoped out only about 28 feet high for a distance of 150 feet, and the reserves at this mine are therefore very large. The average value of the ore is estimated to be about \$20 per ton, and since September, 1869, there have been taken out about \$300,000 from the Dunlap and Gold Hill lodes.

The ore from both lodes is brought out in cars through the lowest levels, and on the extension of the same track it is taken directly into the mill and dumped behind the batteries.

The mill, also owned by the Gold Hill Company, is a very spacious and substantial building of about 80 by 100 feet. There are 25 stamps, weighing 600 pounds each, dropping $7\frac{1}{2}$ to 8 inches sixty times per minute, crushing 45 tons per day, the ore being very soft. Two copper plates in the mortar-boxes and copper tables are used to amalgamate. The tailings from each battery run separately into a concentrating-machine, where the large amount of sulphurets is concentrated and saved for further treatment. There are now from 1,200 to 1,500 tons on hand, representing a net cash value of at least \$50,000. The managers of the works, Messrs. R. Mootry and D. Coughenour, intend to erect chlorination-works for their reduction as soon as practicable.

The tailings from the concentrators are run through sluice-boxes, provided with copper plates, in order to catch the last particles of quick-silver and amalgam escaping the buddles.

The motive-power is furnished by an 80-horse power engine with two tubular boilers, which consume four cords of wood per day, worth \$4 per cord, delivered. Miners receive \$75 and board per month.

Both the mill and the mines of this company are specimens of good management. Everything is done in the most substantial and at the same time economical manner, and owing to this fact they are enabled to realize, in spite of the high cost of labor and materials, a handsome profit from ore which, on an average, yields probably less than \$15 per ton. Thirty thousand dollars' worth of supplies, such as wood, timbers, lumber, and other materials, are on hand.

Ninety feet north of the Gold Hill is the Lone Star lode, owned by R. Mootry, J. C. Isaacs, and others, for a length of 1,600 feet. The out-croppings of this lode have, by sluicing, yielded, in several places, a large amount of money, and it is generally believed to be one of the best, if not the best lode in the camp. Besides the work on the surface, there is only one tunnel 80 feet long, started on a level with the creek. The lode runs northeast and southwest. The dip changes constantly on the surface, the lode being considerably broken up for nearly its whole length. The property is at present in litigation, and has not been worked for a long time. If the suit is decided in favor of the above-mentioned parties, the mine will be worked from the lowest level of the Gold Hill and in connection with that mine.

The Pioneer lode, situated 200 feet south of the Gold Hill, has been claimed for 2,000 feet. Course, northeast and southwest. Dip, 70° south. The lode has yielded about \$100,000 from different small but exceedingly rich pockets near the surface.

The Golden Gate lode is close to the Dunlap and south of it. It was worked during the winter of 1863, and the stock sold, at one time, as high as \$50 a foot. A tunnel 150 feet long has been run in on the vein, and shows a uniform pay-streak 2 feet in width.

Adjoining the Dunlap on the north side is the Granite lode. It is claimed for 800 feet. The work is confined to the surface, from which about \$1,500 have been taken by sluicing.

Besides the above, there are the Gray Eagle, with a tunnel 150 feet long; the Columbia, with 200 feet of tunnels; Webfoot, 600 feet; California; the Dictator, with 100 feet of tunnel; the Gold Bar, 100 feet of tunnel; Yellow Jacket, and others, all of which have yielded more or less rich ore, but the works are now mostly caved in, and the mines are

idle. The new mining-law will probably do much to rouse considerable activity in this district for the next year.

In the neighborhood of Pioneer there are several silver-bearing galena lodes. Smelting-works were erected, several years ago, to work these over, but they are idle now. The Duncan and Justitia are considered the best veins.

Some work has been carried on in *Banner district*, about twenty-eight miles northeast of Idaho City, in the Banner, Wolverine, and a few other lodes. The two named have furnished a quantity of very nice silver-ore, and further development will, in all probability, prove these lodes to be valuable property. At the time of Mr. Wolters's visit, work had been stopped, ladders and ropes were removed, and it was therefore impossible to examine the mines.

The yield of the placer-mines of the Boise Basin is steadily decreasing, though not as fast as that of the northern placer-mines. There are several good claims yet yielding from \$10,000 to \$20,000, but the majority are in the hands of Chinese, and an estimate of their yield is therefore very difficult.

Alturas County.—The placers of Atlanta district have never yielded large returns. They are not extensive, and some of them can procure a sufficient supply of water only for a very limited season. Quartz Gulch, which is crossed by the Atlanta and all other lodes north of it, has been worked ever since it was discovered, and has yielded from \$6 to \$20 per day to the hands. In a northern direction, about three miles from the Atlanta lode, are other placers, high up on the ridge, which have to obtain their water mostly from the melting snow, and can be worked only for a few weeks in the spring. They are, however, reported to be very rich.

Fifteen to sixteen miles below Atlanta are the placers of Middle Boise. There are two or three extensive claims worked, and two companies of Chinamen are working on the Yuba. In the other camps there are only a few Chinese. The yield of the placers of Atlanta and Rocky Bar for the last year is estimated by Mr. Dilley at \$150,000; I am, however, inclined to think this estimate too high. The lodes of Alturas County are numerous, and have always enjoyed the reputation of being rich. Eastern capitalists have invested in several of the prominent veins, but very little work has been done, owing to several circumstances, which it would lead me too far to enumerate. The main lode is—

The Atlanta: It runs east 17° north, dips north near the surface, but changes in this respect at a slight depth, and dips then southerly. There is one tunnel on the lode, 380 feet long, gaining a depth of 180 or 190 feet. At the end of the tunnel a shaft has been sunk 43 feet deep, under a lease, which gave the working-party all the ore taken out in sinking it. This ore yielded from \$60 to \$70 per ton in a stamp-mill. The tailings were worked over again and yielded from \$30 to \$40 per ton, and it is believed that they contain now as much as was taken out in the re-working. The Discovery claim is owned by Farras, Preston, and others. They have one tunnel on the vein, which gains about 70 feet in depth. On top the croppings are about 60 feet wide; at the end of the tunnel the vein measures 45 feet between walls. It carries two streaks of gold-bearing quartz, one on the north wall $2\frac{1}{2}$ feet, and one on the south wall $1\frac{1}{2}$ foot wide. The gangue matter is quartz and decomposed granite; the country-rock granite. Very nice specimens of ruby silver are occasionally obtained in the mine.

The Leonora lode runs nearly due east and west, dips south, is from

3 to 5 feet wide, and carries, on an average, about 2 feet of ore. It was worked last summer by S. Mattingly. The yield of the ore was not ascertained; it is, however, known that several samples of tailings assayed at the rate of \$90 per ton. There are three shafts on the lode, two of them are 100 feet apart, and measure respectively 85 and 60 feet in depth; the third is only 40 feet deep. Levels have been run from the bottom of the shafts, both ways, and the ground above is stoped out. The predominating metal in this and the lode is gold.

The Empire State runs nearly east and west, and dips slightly south. There is a tunnel on the vein 150 feet long, gaining 60 to 70 feet in depth. A lot of 14 tons of ore, worked by Mr. Huffacker, yielded at the rate of \$74.90 per ton. Several smaller lots of a few tons each yielded from \$70 to \$85 per ton. The crevice is 5 feet wide the ore-streak 2 feet. Gold predominates largely.

The Tahoma runs parallel to the former, at a distance of 250 to 300 feet, is 12 to 14 feet wide, and carries from 2 to 3 feet of ore, in which silver predominates. Several tons were worked and yielded pretty fairly; the exact amount could not be ascertained. The developments on the lode consists of a couple of cross-cut tunnels, which intersect the vein at a depth of 40 to 50 feet.

The Stanley, owned to a great extent by English capitalists, is believed to be the extension of the Tahoma. A tunnel 400 feet long has been run partly on the lode, showing it to be from 16 to 20 feet wide. The ore occurs in bunches, the vein being considerably broken up. Small test-runs yielded about \$100 per ton, and it is expected that more developments will prove this to be a very valuable lode. Ruby silver is frequently met with in the ore, which carries only very little gold.

Besides these lodes, there are the Union, Gray Eagle, Jessie Benton, John Bascom, Eclipse, Silver Tide, Old Chunk, all on the north side of the Atlanta. On the south side are the Golden Reef, Pacific, Minerva, Varieties, William Tell, Liza Hull, Hard Times, Confidence, and many others. All of them look very promising, but are developed only by prospecting-shafts and tunnels.

At Rocky Bar there are some excellent lodes. The Ida Elmore and Wide West have both been worked last summer, but it has been impossible for my agent to either visit this district in person or to obtain reliable data in regard to it.

CHAPTER IV.

OREGON.

From the western part of the State there is little to report. The languishing industry of the once productive counties of Jackson, &c., appears to have experienced no revival during the year. In Baker, Union, and Grant Counties, however, east of the Cascade range, considerable activity has prevailed. I estimate the yield of Oregon and Washington at \$2,000,000. Mr. Dudley Evans, express-agent at Portland, estimates \$1,900,000, to which I have added \$100,000 to cover amounts produced near the California line, and finding their way directly southward.

COAL-FIELDS AND GOLD-BEACHES.

The following abstract of an interesting paper read before the California Academy of Sciences, by Mr. W. A. Goodyear, of the State geological survey, is taken from the Mining and Scientific Press :

After crossing the State-line, on descending the northern slope of the Siskiyou Mountains, in Oregon, we come to the little village of Ashland, on Bear Creek, a branch of the Rogue River. At this place I saw some marble tombstones, the material for which was said to have come from the Siskiyou Mountains on the south. The Valley of Bear Creek is underlaid by unaltered sandstones.

The mountains, which rise quite high on the north side, present every appearance, for many miles, of being also made up of unaltered sandstones and shales, beautifully stratified.

I saw nothing in Southern Oregon along this route which looked volcanic, excepting two or three flat-topped hills, a few miles northeast of Jacksonville, known as the "Table Rocks," and famous in Oregon as the locality of a desperate battle with the Indians in the early days. The capping of these hills is, in all probability, a table of basaltic lava.

Between the Rogue and the Umpqua Rivers the country is very mountainous and heavily timbered. The road here crosses two prominent mountain-ridges, descending at last to Canyonville, beyond which place it crosses the Umpqua River, along whose right bank it then continues to Roseberg. From here a newly-constructed wagon-road runs west sixty-three miles to Coos City, crossing the Coast Range of mountains at an altitude of 4,000 feet.

Coos Bay.—A peculiar feature of the country about Coos Bay is the numerous tide-water sloughs, which stretch far inland to distances ranging from ten to thirty miles from the coast. All the lower part of the Coquille River is a tide-water stream of this kind, and Coos Bay itself has half a dozen arms through which the tide ebbs and flows for miles back into the country in all directions.

So far as yet known, there is not more than one workable bed of coal in the Coos Bay coal region. The new mine recently opened by Messrs. Hardy & Goodale, on the north of the bay, is undoubtedly on the same bed as the Eastport and Newport mines to the south. Nevertheless, the coal-field about Coos Bay is very extensive, reaching certainly from the coast ten or twelve miles back, and from the bay south to the Coquille River, and north as far as the Umpqua. Coal of good quality is reported on the North Umpqua east of the coast range of mountains. It is needless to say, however, that in a region so cut up by gulches, the portion of this broad area, which is covered by coal of good quality and workable thickness, is comparatively small. In fact, there is no coal here which it will pay to work for many years to come, except that which is situated in close proximity to the shores of Coos Bay.

The coal-bed here consists of two strata, each from 2 to 2½ feet in thickness, separated by a stratum of clay-rock, from 6 inches to a foot thick. Above the upper layer of workable coal is another stratum of rather hard clay-rock, from a foot to 18 inches thick, and over this again another stratum of coal of nearly equal thickness. But this upper layer of coal, though generally of good quality in the Eastport and Newport mines, is not worked.

The quality of Coos Bay coal, as compared with that of the Mount Diablo mines, is better for some purposes, and for others not so good. For domestic use it is preferred

to the Mount Diablo, as it does not crumble quite so badly in the fire as the latter coal, and consequently makes rather a freer and open-burning fire. It is also often said that the odor of the Coos Bay coal is less offensive than that of the Mount Diablo coal. But this is a statement in which there seems to be more of fancy than of truth.

For steam purposes, the evidence of chemical analysis goes to show that the Coos Bay coal is not worth quite so much per ton as the Mount Diablo coal. This fact appears to be chiefly due to the somewhat larger percentage of water which the Coos Bay coal contains, and which not only diminishes by an amount equal to its own weight the heat-producing substance of the coal, but also requires a considerable quantity of heat for its own volatilization. In the Coos Bay coal the texture of the wood from which it was formed is often beautifully preserved. Several of these facts, as well as some facts in the physical and geological features of the country itself, point to a probability that the Coos Bay coal is of somewhat more recent formation than the Mount Diablo beds. Before leaving Coos Bay I visited the site of the old town of Randolph, now deserted, on the mouth of Whisky Run, a small creek which enters the ocean some four miles north of the Coquille River. The surface of the country from Whisky Run to the Coquille River for a mile or so back from the coast consists of low rolling hills of sand and gravel, covered with a thin soil, which supports a scanty growth of grass and scattering trees. These hills front the sea in a continuous line of bluff. The sands of the beach along the foot of this bluff for three or four miles to the south of Whisky Run have been in the past extensively worked for gold, and are said to have been very rich. It was this beach-mining that gave rise to the town of Randolph, and that alone supported it as long as it continued to exist. The working was carried on chiefly with the shovel and long tom. The gold-sand was uniformly very fine; no single nuggets having ever been found of more than 4 or 5 cents in value. It was impossible, of course, to save all the gold. The loss in the tailings was constant and heavy, and a considerable portion of the ground here is said to have been worked over six or seven times in succession, paying well each time. The locality at and immediately south of Whisky Run is said to have been enormously rich; and it is stated that for a little while it was no rare thing for a single miner to take out a thousand dollars' worth of this fine gold-dust in a day.

My informant upon many points relating to the history of this work was F. G. Lockhart, who has been in this country some eighteen or twenty years, and is thoroughly familiar with it. He is now engaged in working a "black-sand" mine at a different locality, of which I shall presently speak. He tells me that the productive stratum along this beach was a layer of black sand, from 1 to 2 feet in thickness, generally buried from 2 to 5 feet deep beneath an accumulation of lighter sand. But this last accumulation appears to be a transient thing, as the action of the wind and waves on this beach varies greatly at different seasons, sometimes casting up large quantities of sand, and again sweeping it all away, so that the surface of the beach is constantly changing, and is at sometimes 5 or 6 feet higher than it is at others. It thus appears probable that the auriferous stratum of black sand lies at the bottom, and forms the floor of what may be called the *zone* of perpetual change of the beach. It is also said to have covered the whole width of the beach from the very base of the bluff as far out beneath the waves as it has ever been possible to carry explorations at the lowest tides.

It has long been a popular belief, and is still the opinion of many, that this black sand, together with the gold which it contains, have come from the depths of the sea, having been simply cast up by the action of the waves upon the beach. But such, in my opinion, is not the fact. I know of no argument in favor of such an idea beyond the simple fact that these sands are found upon the beach; while there is a strong *a priori* argument against its probability in the high specific gravity of the black sand itself as well as the gold, and, in fact, that the heaviest materials are not those which waves most readily throw up upon the beach.

There is no difficulty here in pointing the finger at once to a perfectly adequate source for all the gold without going to sea to hunt for it. In the first place there is no difficulty with the pan and shovel in finding the color of gold, not only throughout the material which forms the face of the bluff that fronts the beach, but also almost anywhere on the surface of the low rolling hills stretching backward from the bluff; and in the second place, there is plenty of evidence that the whole front of the bluff itself is wasting away with comparative rapidity by the action of the waves and storms.

The beach receding.—At one point I saw in the sands of the beach the stump of a tree 6 or 7 feet in diameter, evidently where it grew, the wood but partially carbonized, the fiber brown and soft, though still rather tough, and exactly resembling in character the woody fiber in a bed of incipient lignite or half-carbonized vegetable matter 2 or 3 feet thick, which crops out for a long distance, in the face of the bluff, a few feet only above the level of the beach, and buried under from 30 to 50 feet of the half-consolidated sand and fine gravel which form the upper part of the bluff. Mr. Lockhart states that when he first saw the stump, eighteen or twenty years ago, it was about half covered up by the foot of the bluff; now the foot of the bluff is at least 20 feet from the center of the stump.

At this point, when the tide is low, the tops of a number of other stumps may be seen, still standing upright where they grew, but ordinarily covered with water now, and some of them a hundred yards or more outside of present mean low water line.

A black-sand mine, which Mr. Lockhart is now working, is not on the present beach at all, but is back in the timbered country two or three miles southeast from the mouth of Whisky Run, and 190 feet above sea-level. This height of a former beach above the sea is another indication of the comparatively recent changes of level here.

In opening a tail-race from his mine to the sea, Mr. Lockhart has made, with the aid of water, a cut half or three-quarters of a mile in length and from 25 to 40 feet deep, straight through the low rolling hills that border the shore, thus exhibiting a fine section of their structure. Here, as well as in the bluffs along the beach, they are seen to consist of alternating beds of sand and fine gravel, lying everywhere nearly horizontal. Sticks and logs are not uncommon, scattered through the mass, and in the cut some trees have been unearthed, still standing where they grew. Two or three large stumps still remained upright in place at the time of my visit, with their roots about 40 feet beneath the present surface of the hills, and with their woody fiber in the same condition as that in the bed of half-formed lignite which crops in the bluff along the beach.

I was shown a human skull, probably that of an Indian woman, which was found some years ago in the bluff itself about 10 or 12 feet beneath the top and under several feet in thickness of the fine gravel deposit which helps so largely to make up this formation. The skull has evidently been long buried, but it might possibly have been covered by a slide, and I have little faith that it is really as old as the gravel of these hills.

Colonel Lane states that in his mine the black sand, so far as worked, has averaged from 5 to 6 feet thick. There is more or less fine gold scattered all through this sand, and also some platinum, mingled with more or less iridosmine.

The difficulty of saving gold from the black sand appears to be due chiefly to two causes: to its fineness, which permits it to be so readily washed away by a stream of running water; and from the fact that a portion of it seems to be coated with a substance which protects it from the action of the mercury. It is not so clear of what this film consists. Mr. Wright, who owns a black-sand mine north of Lockhart's, thinks that in his mine it consists chiefly of organic matter, perhaps of bituminous oils. He burns his sand in heaps before amalgamating it, so that it is exposed to a high degree of heat for several hours. He then works it in an arrastra, and by this treatment he obtained two or three times as much gold as he could without the burning.

At the time of my visit, Mr. Lockhart was making preparations to apply, on a large scale, Plattner's chlorination process, to extract the gold from these black sands.

With this material no expensive preliminary roasting will be required, and if the chlorine will dissolve with sufficient rapidity gold which is as coarse as this, I see no reason why it may not prove a complete success in the extraction of gold. The experiment is well worth trying, and it will be interesting to know the results which he obtains.

Volcanic formations.—I left Coos Bay on the 9th of November for Portland. Between Roseburg and the head of the Willamette Valley, I noticed considerable unaltered rock, both shales and sandstones, in various railroad cuts.

I saw nothing that I could recognize as volcanic till I reached the vicinity of Albany, where the gravel used in ballasting the road contains volcanic pebbles.

Some twenty-five or thirty miles before reaching Portland we struck the basaltic bluffs, on the right bank of the Willamette River, and from that time forward I saw no rocks except volcanic till after I left Portland for San Francisco.

I will not attempt to describe the magnificent cañon of the Columbia River, through the Cascade Mountains, between Portland and the Dalles, so familiar to all travelers in Oregon. I will only direct attention for a moment to one most striking contrast between the character of the volcanic matter here, and that on the western slope of the Sierra Nevada, in California. The Cascade Mountains, where the Columbia cuts through them, appear to be entirely made up of a series of superimposed sheets of lava, which, when it flowed, ran not into narrow streams, but spread its fiery floods both far and wide in all directions over the then smooth, or nearly level, or very gently sloping country. They, therefore, consist to-day of terraces of solid compact rock from base to summit, and the quantity of breccias, or fragmentary materials of any kind, is comparatively so small as to be hardly noticed.

The western slope of the Sierra Nevada, on the contrary, shows its volcanic matter almost exclusively in fragmentary forms. Beds of ashes, breccias, and volcanic gravels and conglomerates are everywhere; but lava-flows are few and far between.

This is true especially in the central portion of the State. But throughout the central and southeastern portion of the Sierra there is, so far as I know, on the western slope, but one great lava-flow—the Tuolumne County Table Mountain. Moreover, the total quantity of volcanic matter in the mining countries of the Sierra Nevada is utterly insignificant compared with the vast accumulations that have built up the Cascade range. The absolute quantity in the Sierra is indeed great; but that in the Cascade Mountains is more than great, it is stupendous.

GRANT COUNTY.

For the following information concerning the districts around Canyon City, I am principally indebted to my very courteous and intelligent correspondent, Mr. W. V. Rinehart, of that place. The mining industry of the region has declined in some camps and flourished in others.

Canyon City district is chiefly worked by Chinese, and the yield has been as large as in 1872. Several new claims are being successfully worked on the side-hill west of Canyon Creek. The hydraulic claims of Thompson & Co. and L. C. Hillis, at Marysville, have yielded fair returns. The claims (also hydraulic) of John Long & Co., in Town Gulch, have yielded good returns. These three are the principal ones worked by white labor in this district. Some very rich specimens of gold-bearing quartz were picked up during the summer near Marysville, inducing the belief that the vein from Prairie Diggings may be traced to the mountain south of Canyon City; and rich deposits are looked for. The quartz-mill at Prairie Diggings stopped for the season after a short and unprofitable run during the summer. The vein has been lost, and the slide-rock from which such rich pay was taken at first has been exhausted.

Dixie Creek is worked by Chinese, except four large claims, near the mouth of the stream, which yield well. The yield in this district is thought to be about equal to that of last year.

The Burnt River, Olive Creek, Granite, and Elk Creek districts have all declined perceptibly in their yield during the past year. The falling off in population is about one-fourth, and the decrease in the yield is proportionate. The quartz at Elk Creek remains untouched. A lack of confidence in quartz-mining seems to prevent investments in this line. Capital from abroad and an infusion of California energy are needed to develop this industry. Numbers of successful miners have invested in cattle during the past year, and forsaken their former occupation. The closest estimate that can be made of the gold-dust shipped from this section during the year gives an average monthly shipment of \$21,500, besides what has been taken away by private hands, which will probably increase it to \$30,000 per month, or an aggregate of \$360,000 for Grant County for the year 1872. This looks large, considering the decline in several important districts, but, on the best information I can get, I feel sure the estimate is not too large. I think the counties of Baker and Union yield more together than Grant, while Jackson and Josephine in Southern Oregon yield about the same as Grant.

BAKER AND UNION COUNTIES.

For valuable notes from this part of Oregon, lying east of the Blue Range, I am chiefly indebted to Mr. E. W. Reynolds, of Baker City.

The water-supply has been greater during the past year than the year previous; but the late completion of the various ditches in the country prevented the miners from reaping much benefit therefrom. Still I estimate the yield in gold-dust as fully up to that of 1871; perhaps a little better. The mining population has apparently not increased much during the past year; the gain in population being in farmers, mechanics, traders, speculators, &c. Winter set in much earlier than usual. About the 8th or 9th of November, snow fell 6 inches deep in the valleys, and a foot or more in the mountains. After that time wet, windy, and disagreeable weather prevailed. At the close of the year the ground in the valleys and low foot-hills was bare of snow, and our roads were

muddy and rough. The large rain-fall and a goodly supply of snow in the mountains indicate a season of abundant water in 1873. I think the amount of placer-gold carried out by private hands is not less than in the last year.

Trade has been good in town and in the mining-camps generally. There are, perhaps, fewer traders; but those that remain do a better business than formerly. Last summer Messrs. W. B. Crane & Co. sold their copper-mine and smelting-works, located about twenty-five miles northeast from Baker, in Union County, to Messrs. Carson, Williams & Co., of Detroit, Michigan. Crane & Co. also sold to the same company hill-diggings, with a 60-foot bank of gravel, situated on the head-waters of Grande Ronde River, in Union County. The new company at once put on a large force of Chinamen, and continued work until cold weather, bringing in a ditch from the river to the hills. They will resume work in the spring on a large scale with Chinamen and hydraulics, and expect a heavy yield. In the copper-works one smelting was made, the result being $4\frac{1}{2}$ tons copper, shipped recently from Portland by steamer to San Francisco; and thence by rail to the East. I am informed that the cost of the copper-pigs, delivered in the East, will be between \$60 and \$70 per ton.* As the company has plenty of good ore, easily accessible, a profitable business is anticipated.

At Hog Em, in Union County, there have been some new discoveries of rich quartz-lodes, carrying free gold. The district contains one small 3 or 5 stamp mill, besides the steam 10-stamp mill of Messrs. White & Myrick, removed thither last summer, and now doing custom-work.

Eagle Creek district.—This district, in Union County, contains the camps of Sparta and Gem City. The ditch was not finished until late in the summer, and is not of sufficient capacity to supply the district. Messrs. White & Myrick are doing well at Gem City with their 10-stamp steam quartz and saw mill in connection. They have recently struck good rock in the Gem lode, and are now at work. This district promises well for next season.

Pocahontas district.—Along the western side of Powder River Valley, in the Blue Mountain divide between Powder River and Grande Ronde, are the Pocahontas and the Rock Creek districts, the former of which has yielded well. The Salmon Creek, McCord Gulch, Ruan, and Fry-ing-Pan claims have natural water early in the season, and, later, buy of the Auburn Canal Company.

Rock Creek district.—This district has a ditch affording an ample supply of water during the entire season, owned by Ingraham, Ford & Co., who also own a large tract of mining-ground on Little and Big Muddy Creeks, and during the season run three hydraulics. This ditch runs 1,000 inches of beautifully clear water. There is also a smaller ditch affording 300 inches, owned by Iler & McCord, who run two hydraulics. Mr. Ingraham reports that the claims are doing well and considers their ground and water-privileges invaluable. Further down the slope Bunch & Co. are running during the season one hydraulic on Wolf Creek with profit. All these parties can work from April until November and obtain an average of \$8 per diem to the man.

Auburn.—This camp has been dull; but a few white companies have worked; and early in the season, for some reason, the Auburn Canal Company refused to sell water, so the little mining done was with natural water, except by Littlefield & Co., who have a small ditch from Elk

* This must be the freight only. Never having visited these works, and knowing nothing of the local conditions, I merely repeat the statement furnished me.—R. W. R.

Creek, and have been running one pipe all summer. There is plenty of good ground about Auburn, and the camp may revive next season.

Beyond Auburn, at Fort Sumter, and still further toward Granite and Olive Creeks, are fine prospects for gold, quartz, silver, and galena. At Winter's diggings, Bull's Run, and along the gulches far up Burnt River, are scattered little camps, where a small population has done so well in placer-mining as to show that increase of labor and capital would be satisfactorily rewarded.

Clark's Creek.—In this camp and its vicinity the placers are as good as ever, and promise to be so for years to come. There has been no special new discovery.

Eldorado and Malheur City.—These camps have had a very limited supply of water, but, with what they had, they have accomplished much. One man is said to have cleaned up \$10,000. There were no new quartz discoveries. The prospects for next season are good.

Amelia district.—This district has been dull and dry; will probably get water from the Big Eldorado ditch next season.

Humboldt or Mormon Basin.—This good old camp holds out as usual, and will for years to come. The ground is all claimed, and the water-privileges are all taken up. There is not nearly enough water to meet the demand. Colonel Colt and L. W. Getchell uncovered this summer their old ledge of rich decomposed gold-quartz, &c., and have been working it somewhat, with the aid of a small mill or crusher, of novel form, invented and erected by Colonel Colt. The success of the experiment has not been reported to me. The mine promises well.

Rye Valley.—This district, thirty miles southeast of Baker City, and just over the divide from Humboldt Basin, bids fair to become a noted silver-producing district. Although known for sometime, but little has been done in developing it. The placers continue to yield well, and the yield of 1872 is rather better than that of 1871. Mr. Green, of Rye Valley, estimates the amount at about \$50,000, which is pretty good considering the short season, of sixty to ninety days only, caused by scarcity of water. The mining is done with hydraulics. With a good fall and 100 inches of water the ground pays from \$30 to \$100 per diem. There is plenty of such ground unworked, but all claimed.

The belt containing the silver-lodes is a granite ridge, about eight miles long and five miles wide. Its longer axis lies in a general northwest and southeast direction. Burnt River is north of it, the south fork of Dixie Creek is south and southeast, the north fork of Dixie, with the town of Rye Valley is east, and on the west are Humboldt Basin, Amelia, Malheur City, Eldorado, and Clarksville. Geologically it appears to be bounded on the east by limestone, and on the other three sides by slate. The lodes are in the granite. Among them may be mentioned, proceeding southward along the ridge, the Monumental, Green Discovery, Macedonia, Pinetree, Mountain, and Washington on the east slope, and the North Star and Rising Sun on the west slope. (The Washington is said to cut into the limestone.) Of these lodes, the Green Discovery and the Monumental, lying about three-fourths of a mile apart, are the only ones that have been developed to any extent, though many of the rest promise well, and the whole range invites more thorough prospecting. The Rye Valley placer-mines are on the north fork of Dixie Creek, between the town and the silver-lodes.

The Green Discovery, owned by Mr. Charles Green, is situated 3,000 feet above Rye Valley. The claim comprises 2,000 feet. It has been explored by four or five shafts of small depth, and three adits run near the surface on the vein, from intersecting gulches. The longest of these drifts has followed the vein 250 feet; and the deepest shaft is

down 40 feet. The vein is said to improve with depth in width and value, and to average at present 3 feet. The ore is quartz, carrying oxidized iron; &c., near the surface, and black sulphurets below.

The Monumental claim, 2,000 feet, owned by the same person, lies 4,000 feet above Rye Valley, not far (though on the opposite slope) from the head of Grouse Creek, a tributary of Slate Creek. This mine resembles in character and dimensions the one just described. It has been opened by three shafts, the deepest of which (150 feet) is said to be in rich ore at the bottom, and to have furnished already a considerable amount of high-grade material. There are two cross-tunnels, one 140 feet long and within 15 feet of the lode; the other 125 feet long and estimated to be 50 feet from the lode.

Mr. Green has on the dumps of these two mines from 50 to 75 tons of ore, which he purposes to sort, and ship the selected ore to San Francisco, where he will then purchase a small mill for erection at the mine. One ton sent some time ago, as a test, from the Green Discovery, yielded in San Francisco \$283 silver and \$4 gold. From the Monumental, one ton yielded \$330, and three tons, sold to Selby & Co., brought \$270 per ton. In these instances but a trace of gold was reported.

Conner Creek.—This is a small stream putting in to Snake River about twenty miles below Farewell Bend Ferry. Three miles up this creek, in June, 1871, Messrs. Wood & Edelman discovered a gold-quartz lode, which they located and afterward sold. The discovery-claim (600 feet) is now owned by Maddox & Palmer, who have an open cut of 60 feet running in on the lode, and a tunnel of 40 feet some 150 feet below the open cut. They have erected and are now running a 5-stamp water-power mill. This being the extent of the available water-power, they purpose erecting in the spring a 15-stamp steam-mill. The ledge will average fully 5 feet in width, and carries white and decomposed quartz with free gold. The bullion is worth \$16.78 per ounce, and the rock-mill yields about \$23 per ton. The first extension northeast is owned by Hover & McCartney, who have an open cut on the lode, 40 feet long, exposing a good prospect. Other quartz-veins have been struck in this vicinity, but no paying placers have yet been discovered on this creek.

Snake River Bars.—These are mined at every season of low water, near the mouth of Conner Creek, and down the river below Pine Creek, with fair results. Four men worked this season near Connor Creek.

On Burnt River, below Express Ranch, some placer-mining has been done; and during the past season Messrs. Sisley & Weatherbee discovered, near their ranch, eight miles below Express Ranch, an old channel, which has proved quite rich. The parties named have taken out a large amount of money; the yield running even as high as \$50 per diem to the man.

Next summer I hope to be able to report rich lodes of argentiferous galena, copper, &c., near Olive Creek, in Grant County, some sixty miles southwest from Baker City. Fine specimens have been brought from that section and several lodes have been located. One called the Mammoth is said to be 5 feet wide. Wood and water are plenty in this vicinity.

The Virtue or Ruckel's mine.—Rockafellow or Union lode, owned by the Virtue Gold-Mining Company, has been repeatedly described in former reports. The present superintendent, Mr. D. H. Jackson, has brought this mine into excellent condition. He is now working twenty Chinamen and twelve white men at the mine. Mr. Jackson is the first man to work Chinamen in quartz-mines north of California. He reports a saving of 50 per cent. from their employment. They work in every capacity—single-hand drilling, &c.

The present workings are 308 feet south of the main shaft, and 85 feet below the level of the long tunnel. The company have steam hoisting-works erected over the main shaft in the tunnel, and run a Blake's pump. The main shaft is down 100 feet below the level of the big tunnel. I learn that my former opinion in regard to the junction of the two veins, the Union and Rockafellow, has been proved correct. They came together in the south shaft, at a depth of 85 feet, giving a 7-foot ledge of gold-ore, and occasionally very rich. Mr. Jackson recently established communication with the old Union works above, and in event of anything occurring to stop work below operations can be continued in the upper levels.

The company have all the machinery on the ground at the mine for a 25-stamp steam-mill, which will be put up at the mine in early spring, to save the cost of hauling seven miles to the present 10-stamp mill at Baker City. The present owners of the mine are Californians. The clean-up for the month of December, 1872, was over \$13,000. I am informed that the mine has produced over \$80,000 during the past year.

Coal.—In French Gulch, Auburn district, several parallel veins of coal have been discovered, and Mr. Reynolds, of Baker City, has located and partially explored a mine upon them. At the depth of 20 feet the principal bed is 2½ feet thick. A sample from near the surface, and doubtless of inferior quality, was sent me by Mr. Reynolds. According to a proximate analysis by Dr. T. M. Drown, of Philadelphia, this sample contained—

Moisture	14.68
Volatile matters.....	38.95
Fixed carbon	42.57
Ash.....	3.80
	100.00

As pointed out in a subsequent chapter, (on water in western lignites,) analyses which do not determine the ultimate constituents afford us reliable data for comparisons of heating power of lignites, since these coals always contain oxygen, as well as hydrogen and carbon, among the so-called volatile matters. The following is the ultimate analysis of the Reynolds lignite, by the same chemist:

Moisture	14.68
Carbon	60.72
Hydrogen	4.30
Oxygen	14.42
Sulphur	2.08
Ash.....	3.80
	100.00

Or—

Moisture	14.68
Combined water	16.22
Hydrogen	2.50
Sulphur	2.08
Carbon	60.72
Ash.....	3.80
	100.00

I presume from these analyses that the coal will prove valuable for steam-generation and domestic uses; that it will not coke well, and that it is not suitable for metallurgical uses, except in gas-generators.

CHAPTER V.

MONTANA.

The collection of the mining-statistics of this Territory for 1872 I have intrusted to Mr. William F. Wheeler, of Helena, Montana, whose extensive acquaintance in the Territory has enabled him to send me detailed estimates of the product, and, considering the means at his command, very full data in regard to the several districts. His estimates of the yield of gold and silver of Montana for the year 1872 are derived from shipments by express, from purchases made by bankers, brokers, and merchants, and from miners and others who have not shipped by express, and who have given him what they believe to have been the yield of their several mining-districts.

Gold shipped by Wells, Fargo & Co*	\$3, 471, 395
Gold from Missoula, by "pack-trains," to Walla Walla	200, 000
Gold taken out of the country in private hands, overland and down the Missouri†	1, 500, 000
Gold taken out retained in hand by miners for winter ex- penses	550, 000
Total gold	5, 721, 395

* In regard to this item, Mr. Wheeler says: "I have taken the actual shipments by 'express' of gold-dust and refined-silver bars. But I find by inquiry of the several banks and brokers that they have *purchased* nearly half a million more than the amount reported *shipped* by express, in the Territory. The contracts of the banks in the Territory with the express company begin with May 1, 1872, and end with May 1, 1873. The bankers all say they will be able to fulfill their contracts, as they have four months to make shipments in; therefore the amount will have to be furnished from the yield of 1872, and I am thus justified in adding that sum to the amount named as the yield for 1872 in my report, which will make the total yield of the Territory for 1872 upwards of \$7,000,000.

[I quote the above statement, without adopting the suggestion, since it seems to me that there would be no fairness in adding the first shipments of 1873, on the ground that they contained product of 1872, to an aggregate, which, by the same reasoning, must contain a part of the product of 1871. I have, therefore, retained the original figures, representing simply the shipments of 1872.—R. W. R.]

† On this point Mr. Wheeler says: "Toward autumn, after the season's work in our placer-mines is done, large numbers of miners go to Utah, Nevada, and California to seek employment for the winter in the numerous silver and gold-quartz mines there, and return in the spring to work their placer-mines here. They generally go in companies of ten to twenty, and carry with them the product of their past summer's work, in order to avoid 'express charges,' which are from 2 to 3 per cent., and for mutual protection. The sums which they take away are large in the aggregate, and the express company is the least likely to know the amounts, in the case of travelers by the coaches, since the express company assume to charge for all gold carried in this way. Many passengers in the stages take from \$1,000 to \$5,000 with them secretly, to avoid paying these express charges. I know of one company of miners who traveled by their own conveyance and took out last fall \$60,000. I doubt if I have sufficiently estimated the amount thus taken out, by a quarter of a million. Much of this gold is sold in Utah, Colorado, and California, and is deposited in the mints at Denver and San Francisco, and is not reported as the yield of Montana."

SILVER.

Refined-silver bars shipped by express	\$97, 944	
220 tons base bullion, shipped by wagon to Corinne, value \$500 per ton	110, 000	
60 tons base bullion, shipped East, via Fort Benton, at \$500 per ton	30, 000	
410 tons silver-ore,* shipped by wagon to Corinne, value \$200 per ton	82, 000	
135 tons silver-ore, shipped East—75 tons via Fort Benton, and 60 tons by wagon to Corinne—value \$200 per ton	27, 000	
		346, 944
Value of copper-ore shipped for assay		5, 000
Total coin value		6, 073, 339

The foregoing estimate is accompanied with the following certificate from leading citizens of Montana, which refers to the estimate for the previous year also:

The undersigned, citizens of Montana, have examined the data upon which the foregoing estimates are based, and are satisfied that Mr. Wheeler has made a very moderate statement of the gold and silver yield of Montana for the year 1872. We have also examined his report for 1871, and consider his estimate of \$8,050,000, as the yield for that year of gold and silver from the mines of Montana, as very correct.

D. C. CORBIN,

Cashier of the First National Bank, Helena.

T. H. KLEINSCHMIDT,

Assistant Cashier First National Bank, Helena.

GEORGE W. FOX, of FOX, LYSTER & ROE,

Bankers.

L. H. HIRSCHFELDT & BRO.,

Bankers.

R. E. FISK,

Editor of the Helena Herald.

D. S. WADE,

Chief Justice.

I am confident that the above estimate is largely *under* the actual yield.

S. T. HAUSER,

President of First National Bank.

I have deemed it unnecessary to go again, in the present chapter on Montana, over the whole ground treated in my former reports, especially as the changes in the placer-mines, as well as in the older quartz-districts, are not great. I have, therefore, mainly confined myself in the present report to the description of the new silver-districts, which, through the stimulus exerted by the success of the silver-mines of Utah and Nevada, and the near approach of railroads, have sprung up in all parts of the Territory.

I have always, and especially since my personal visit to the Territory, considered Montana an excellent field for this branch of mining, and the developments made during last year have confirmed me in the high opinion which I have heretofore held in regard to the great value of the Montana silver-ores.

* Mr. Wheeler says: "There are, to my own knowledge, more than 3,000 tons of silver-ore lying on dumps at the mines, and waiting for purchasers, or for spring to permit shipments, &c., of which I have made no account. This cannot probably be included, the value being uncertain, and the amount, whatever it is, sure to find a place in the aggregate for a succeeding year."

It is noteworthy that most of the silver-ores in Montana occur in fissure-veins, and not in limestone-deposits. This circumstance encourages the hope that the silver-mining industry of Montana, if it does not bring forth such an immediately brilliant and voluminous product as certain districts in Utah and Nevada have done, will at all events be more enduring and permanent.

BEAVER HEAD COUNTY.

Notes in regard to the silver-districts of this county have been furnished by Mr. S. F. Dunlap, of Bannock.

The yield of gold and silver for the year 1872 is estimated by him to have been over \$300,000, \$50,000 of which was in silver-bullion. There were also shipped to the East over 100 tons of lead-bullion. Two tons of lead and two tons of rich silver-ores, from the Del Monte and Huron lodes, were shipped to Swansea, but up to the present time nothing has been heard in regard to the proceeds. There were also several tons of copper-bullion smelted from the Greenwich and shipped East. The value in gold and silver of this shipment is not stated.

The principal silver-developments during the past year have been made in the Blue Wing district, which is situated from two to five miles east of Bannock. There has also been a good deal done in Vipond district, about forty miles north of Bannock. But little has been done at Argenta. Argenta is about fifteen miles north of Bannock. It has been much neglected the past two years, on account of the greater richness of the mines developed in the other districts.

In Blue Wing district the lode from which the district takes its name was the first discovered and recorded. It occurs in limestone. The ore is a rich argentiferous galena, and the vein is on an average 6 inches wide, opening out now and then into large pockets. It was not traceable on the surface, but has been opened for 80 feet along the course. The shaft is 150 feet deep. In the last few feet the ore pinched, but the workmen are still sinking, with every prospect of developing another body of ore. About 200 tons of the Blue Wing ore was sold to the Argenta furnaces, bringing at first \$35 per ton, but lately \$65 has been paid. At present there are only 3 or 4 tons of first-class ore on the dump.

The Whopper is in the vicinity of the Blue Wing, and contains both smelting and amalgamating ores. The ore-streak is 12 inches wide, in a crevice of 3 feet. It is not traceable on the surface, but has been uncovered in length for 80 feet. The main shaft is 70 feet deep, and shows plenty of ore in view. The ore occurs rather in pockets, the country-rock being limestone. About 200 tons of ore have been raised, which brought \$35 per ton.

Some work was done on this level during the winter, but, owing to the insecurity of the shaft, the prospector, Mr. Larwell, took his men off, and put them to work on the Potosi, an undeveloped lead of great promise, and traceable on the surface by the rich croppings over 1,000 feet.

The Joe Davis is located several hundred feet east of the Whopper. The vein is 8 feet wide. The ore is a brownish-black mineral, containing much blende and a small percentage of galena. There are 75 tons on the dump. The wall-rock is galena.

The Kent is a large vein of silver-bearing rock in the same hill. It contains principally amalgamating-ore, with a small percentage of galena. There are 60 to 70 tons of ore on the dump.

The Charter Oak is a large vein containing first-class silver-ore. It is not traceable on the surface. There is one shaft 40 feet deep. The crevice in it is 8 feet wide, and uniform in size from top to bottom. The ore is a mixture of green and blue carbonates of copper, and gray and brownish-black lead and silver minerals, sulphuret and chloride of silver being quite frequent. Over three-fourths of the ore is good smelting material. Of the 135 tons on the dump, over 100 tons are first-class ore. The owners, Messrs. Nay & Herr, have resumed work, and will sink during the winter months. There is very little waste or gangue in this lead. It occurs on the dividing-line between limestone and granite, as are also the Puritan and Silver Rose. There has been a good deal of work done on these latter leads, but they are idle at present. From 25 or 30 tons of ore are on the dump of the Silver Rose. Quite a lot has been sold.

The John Wesley is a pockety vein in limestone. The shaft is 40 feet deep. The ore is very rich, according to assays which have been made, and is excellent milling-ore. Several tons were crushed in the Butterfield mill the past summer with most satisfactory results, although the mill was poorly fitted up for silver ores. This was the only satisfactory experiment in amalgamating silver-ores ever made in the country.

The Rollins is an 8-foot vein cropping out in the limestone for a distance of 1,000 feet. It is one of the new discoveries, and but little work has been done on it. There are 8 or 10 tons of ore on the dump. The vein is of uniform width so far as it has been developed.

The Whittrick is another strong ledge cropping above the surface in the same formation, and is visible over 500 feet. There is a shaft 15 feet deep, in which the vein is 5 feet wide, and the ore assays high. The two last named leads are now lying idle.

The Sibley, situated in limestone, has two shafts 35 to 40 feet deep, and a tunnel 200 feet long driven on the course of the vein, which is 3 feet wide. A large amount of ore has been smelted, but it is really milling-ore. It averages \$70 per ton by numerous tests which have been made. There are 50 tons on the dump. The proprietors, Wright & McMeen, are resuming work again.

The New Departure, belonging to the Hon. G. W. Stapleton, is in limestone. The vein is irregular and full of pockets. Mr. Stapleton is now running tunnels and otherwise developing the lead. The vein proper is 3 feet wide. There are two tunnels of respectively 90 and 100 feet in length, developing the vein for a distance of 300 feet. Twenty tons of ore were sold to the Argenta furnaces for from \$45 to \$60 per ton. There were also shipped seven tons to the Bank of California, for which a return of \$1,900 currency was made. The lead contains both smelting and amalgamating ores.

The Del Monte lies in granite, but the ore is easily dug out with pick and shovel. The shaft is 50 feet deep and exposes well-defined wall-rocks. There is one tunnel being run along the vein, 190 feet long. The vein-matter is 2 feet thick at the surface and 6 feet at the bottom of the shaft. The ore-streak of black and brittle silver-ores is 6 inches wide. Forty tons were sold to Bohen & Co., of Argenta, at \$40 per ton. One ton was shipped to Swansea last summer, but no return has yet been made. The assay, however, gives \$331.82 per ton. The lead is one of the best developed in the district. It is traceable for 500 feet on the surface.

The Czar is also in granite, and easily worked. The vein is 3 feet wide, and there is a tunnel along its course 75 feet long. A shaft on it is 55 feet deep. Fifty tons, sold to Bohen & Co., brought \$30 per ton.

Over 50 tons are now on the dump. The lead is traceable for 550 feet. The walls are smooth and the vein regular. The ore is the same as that occurring in the Del Monte, but is harder and contains less lead and more copper.

The two last-named leads belong to Messrs. Sears & Smith, who are at work on them, putting them in shape for selling ore.

The Pony is also in granite; it is a galena vein and easily worked. The ore assays rich in silver. The vein is one foot thick in the bottom of a shaft 45 feet deep. The walls are smooth and regular.

The Snow Drop and Good Friday are both on the same hill, and in limestone foundation. The Good Friday runs along the apex of the ridge, cropping out, and traceable for a thousand feet. A tunnel 50 feet long has been run to intersect the vein, which is exposed in several places. The Snow Drop is 200 feet below, on the south side of the hill. It is a pockety deposit of excellent amalgamating ore. According to assays, the ore contains several hundred dollars per ton. The mine is now being worked, and there are 25 or 30 tons of ore on the dump.

The Great Western is an 8-foot ledge, cropping out in the limestone for a length of over 400 feet. A shaft 15 feet deep has been sunk; it exposes amalgamating ore, an assay of which yielded \$143 per ton. There are 25 tons of ore on the dump. Bohen & Co. offered \$25 per ton for this ore. The owners, Messrs. Sears & Smith, have neglected this claim somewhat, spending their time in developing other leads.

The Black Hawk No. 2 is owned by J. C. Taylor, who is constantly working on the vein. At this time he is down 247 feet, the vein lying in granite. It shows a uniform size of about $3\frac{1}{2}$ feet. The walls are smooth and regular. The ore contains a considerable amount of iron pyrites, and many assays give a value of from \$50 to \$150 per ton. There is a large amount of ore on the dump, probably not less than 350 tons, 25 tons of which are expected to assay \$150 and the balance \$50 per ton.

The Huron is one of the old discoveries in the limestone. There are seven shafts along the lead, from 35 to 80 feet deep. The vein is prospective for 600 feet in length, and is rather irregular, but may be set down at an average width of 3 feet, opening, now and then, into larger pockets. This ore is a sulphuret of silver, and occasionally specimens of chloride of silver have been found. Assays have yielded from \$500 to over \$900 per ton. Mr. Batchelder, the owner, sold 35 tons of ore at \$100 per ton. There are now 65 tons of first-class ore on the dump, and from 15 to 20 of second class. One ton of ore from this mine was shipped, with the Del Monte ore, to Swansea. No return has been made.

The Bonaparte lies in granite. The shaft is 35 feet deep, and shows the vein-matter to be 6 feet wide between walls. The pay-streak of solid ore is $2\frac{1}{2}$ feet thick, and contains much galena. The lode is prospective in length for 150 feet. Thirty-eight tons were sold, at \$25 per ton, to Bohen & Co. Assays have varied from \$276 to \$1,100 per ton. This ore contains also \$70 in gold per ton. The owners, Messrs. Bassett & Ney, are now taking out ore, and have probably 150 tons on the dump.

The British Empire is a newly-discovered lead of great promise. It is traceable for about 400 feet. Fifty tons of milling-ore are on the dump. The vein crosses a limestone ridge. The ore is decomposed and of a cream color. An assay made of it yielded \$372 per ton.

The Pomeroy runs along the apex of a limestone ridge, northeast and southwest. It has the largest croppings in the district, protruding as

high as 8 feet above the surface. It is 8 feet wide, traceable for 2,000 feet, and for 1,100 feet on the extension. There are seven shafts sunk on this ledge, from 20 to 70 feet deep. The vein has been prospected for 1,400 feet. At a point where the vein crosses a deep ravine, it is 20 feet wide. The ore is yellow and often stained blue and green. There are over 500 tons of this ore on the dump. Thirty-three tons were sold to Bohen & Co. at \$35 per ton. The vein dips to the north, and is shown 8 feet wide in the bottom of the deepest shaft, but the north wall has not been reached. Messrs. A. Bassett and A. J. Ney are the owners. They have recently bonded the property for a large sum of money, and have suspended work for the present to await results.

The Queen of the West and the Nodoway are on the Black Hawk Hill, and in granite. The shaft on the latter vein is 40 feet deep, showing a vein of uniform size for the entire distance. These leads are idle at present.

The Union, in the limestone and in the vicinity of the New Departure, is a large vein of most excellent yellow ore, tinted with blue and green. Mr. Bassett is now developing this lead preparatory to the production of ore. It may be asked why the owners of these rich leads have not continually taken out and sold or shipped ore. The answer is simple. The smelting-works, which had been run by Mr. Bohen, were shut up in the middle of the summer, and no other furnaces were prepared to run. There was consequently no demand at home. As for shipping the ores, it had first to be proved that they would pay to ship. Matters came thus to a dead stand. The owners of the various leads, being poor men, were obliged to look elsewhere for work, to obtain the necessities of living. Some went to Utah and Nevada in search of employment. At this time Mr. Isaac Roe shipped one ton of Del Monte and one of Huron ore, together with two tons of argentiferous lead, to Swansea as a test, but, so far, he has not received any returns.

In the mean time Mr. Stapleton shipped 7 tons of the ore from the New Departure to the Bank of California, and recently obtained an answer with results as before stated. It is now probable that considerable ore will be shipped during the next summer, although the means of shipment are so slow—ox-teams and mules—that it requires a whole season to get a return.

At the same time much enterprise cannot be expected until transportation is certain, quick, and cheap; and this can only be furnished by railroads.

Argenta district was the first-discovered silver-district in the Territory.

There are many leads recorded in it. The formation is limestone, and the mineral-deposits are pockety and frequently broken. They contain more lead and iron than those of the Blue Wing district. The hill on the north side of Rattlesnake Creek is full of pockets of all sizes.

The Legal Tender is traceable on the surface for 700 feet, and has been prospected for a thousand feet. There are three shafts from 70 to 130 feet deep. In the early days of smelting at Argenta, over 300 tons of ore were sold from this mine, which yielded an average of \$200 per ton. The vein is irregular, and about 16 inches wide on an average. The ore is rather solid galena.

The Kate is 6 feet wide. The gangue is iron-ore, containing a small percentage of galena. Forty tons of this ore brought \$30 per ton on the dump.

The Stapleton is 3 feet wide, and contains amalgamating-ore. The

shaft is 130 feet deep. Two hundred tons of ore were sold to the Saint Louis Company at \$40 per ton.

The Brownell has two shafts 75 feet deep, and a tunnel of 60 feet along the vein, which is $2\frac{1}{2}$ feet wide. The ore is carbonate of lead.

The Silver Light has a shaft 50 feet deep, the vein being 18 inches wide. The ore is rich argentiferous galena.

The Cable is an 8-foot vein of carbonate of lead, and has a shaft 40 feet deep. Over 300 tons of ore have been taken out and sold for from \$5 to \$10 per ton.

The Tuscarora contains carbonate of lead, and is rich in silver.

Besides these there are hundreds of holes sunk on other leads, from a few feet in depth to 40 or 50 feet.

The failure of the furnace last summer put a stop to all further development. The permanence and richness of the leads in the new Blue Wing district did also their share to attract the attention of the miners, and to draw them away from Argenta.

Bald Mountain, ten miles northwest of Bannock, contains many leads of gold, silver, galena, and copper, but few of them have been developed.

The Badger is a 2-foot vein of argentiferous galena and milling-ore. There is a shaft on it 18 feet deep. Average assays gave \$100 per ton. There are 25 tons on the dump.

The Bald Mountain has a 3-foot vein of argentiferous galena. A tunnel has been run 80 feet along the vein. There are 70 tons on the dump. Thirty tons have been sold to the Bannock furnace at \$25 per ton.

The Shoo-Fly is a carbonate-of-lead vein, 2 feet wide, and traceable on the surface for 300 feet. A shaft 30 feet deep has been sunk. There are 60 tons of ore on the dump. A few tons were sold at \$25 per ton to the Bannock furnace.

The Muck-a-Muck is a strong copper-deposit, rich in gold. By crushing the ore the gold is easily panned out. There is a shaft 15 feet deep, and 75 tons of ore on the dump. It is from 30 to 40 per cent. copper.

There is no work being done on these leads this winter.

On the Big Hole, from sixty to eighty miles northwest of Bannock, there are numerous leads of copper, iron, and gold. The Sherman is the only one recorded. It is a prominent ledge, 10 feet wide. The ore is copper, and bears gold. There is a shaft 10 feet deep, exposing to view a vast amount of ore. It is traceable on the surface several thousand feet, cropping out.

In the hills twenty-five to forty miles west of Bannock, are rich copper-croppings, but no attention is paid to them.

Birch Creek is pre-eminently a copper-district. Besides the copper-veins there are extensive ledges of magnetic iron.

The Greenwich is a strong copper-vein, bearing both gold and silver. The croppings are easily traceable for five miles, and the vein is 8 feet wide. There have been seven extensions recorded. The shaft on the Greenwich is 80 feet deep, and shows smooth granite and slate walls. The vein is of uniform width to the bottom of the shaft. Over 100 tons of ore have been taken out, and about 50 have been sold to Bohm & Co. at about \$10 per ton on the dump. The veins of this district run north and south, and are in granite or slate. The first Greenwich Extension has a shaft 130 feet deep, showing the same width of vein and characteristics as the Greenwich. There are perhaps over 200 tons of ore on the dump.

The Treasury has a shaft 30 feet deep. It is richer in copper than the Greenwich. This ore is said to yield \$800 worth of metals per ton.

The Treasury Extension lies between the Treasury and Greenwich, and in a direct line with them. There is a shaft down about 10 feet, showing the same width of crevice and character of ore as the Treasury.

The Algoma is several hundred feet east of the Greenwich. This vein is $3\frac{1}{2}$ feet wide, and about one-third of the ore is copper-ore. The lead is not traceable on the surface.

There is also an extensive tract of country west of Beaver Head Valley along the foot-hills and mountains, in which there are numerous ledges of iron, copper, and gold. But few of these have been opened, and this so long ago that they are now almost lost and abandoned for the present.

Vipond district.—From this district, which is described at length in my last report, I have the following additional notes furnished by Mr. Charles Wunderlich:

The developments during the past year are slight, the isolated position of the district in the rough Big Hole country keeping back investments of capital. The ores are mainly milling-ores.

Banner, course east and west, crops out prominently for 800 feet; width, 6 feet; depth of shaft, 40 feet; ore on dump, 40 tons; average assay value, \$200 per ton.

Argyle, course east and west, dip north, crops out for 1,000 feet; width, 8 feet; depth of shaft, 20 feet; ore on dump, 15 tons; average assay value, \$165 per ton. Great quantities of "float"-rock are found below the lode, much of which is rich ore.

Bismarck, course north and south, crops out for 500 feet. This lode was recently discovered, and no developments of consequence have been made. The surface ores assay well.

Humboldt, course north and south, crops out 400 feet; width, 6 feet; ore on dump, 35 tons; average assay value, \$200.

Gray Eagle, course north and south; width, 10 feet; ore on dump, 100 tons; average assay value, \$90 per ton.

Mammoth, course north and south, crops out for 1,000 feet; width, 7 feet; ore on dump, 200 tons; average assay value, \$100 per ton. Some of this ore was sold on the dump, broken up, sacked, and packed on mules to Argenta, a distance of thirty miles. It was there put through the smelter, but as the ore contained but little, if any, lead, it was thought it would not pay to work it by that process.

Juno, course north and south, crops out 700 feet; width, 5 feet; ore on dump, 25 tons; average assay value, \$125 per ton.

Horace Greeley, course north and south; width, 10 feet; ore on dump, 25 tons.

Gray Jockey, course north and south; width, 14 feet; ore on dump, 300 tons; average assay value, \$50 per ton.

A wagon-road to the district was made last fall. A Pittsburgh company contemplate building a mill next spring on the Big Hole River, about four miles distant from the principal claims.

DEER LODGE COUNTY.

From this county I have received very little specific information; and especially of the placer-mines of the county, from which by far the largest part of the gold-product is derived, the returns have been very meager.

Mr. Conrad Kohrs, of Deer Lodge City, the owner of the rich placer-

ground immediately below the Atlantic Cable lode, which has been described in my last report, is the only one who has sent a report.

Work on this ground was commenced on June 10, and continued, with several intermissions, until October 20. The amount taken out during that time was \$37,000, 25 per cent. of this amount having paid all expenses of working the mine.

More important in the present stage of development of the Territory are the quartz veins, especially as, to all appearances, the time is near at hand when railroad-communication will render economical reduction of ores and transportation at low prices feasible.

The best-known silver-district in the county is

Flint Creek district.—This district is situated some thirty-five miles to the northwest of Deer Lodge City, and twenty-five miles above the junction of Flint Creek with the Hell Gate River. The silver-bearing lodes are located in the foot-hills south of the creek, three small streams flowing into it passing through the district.

The country-rock is limestone, highly crystalline in some places, so much so that it approaches marble in its purity and appearance. The lodes of most value are found near the contact of the overlying stratified rocks with the granite, into which several of the ledges are known to penetrate, although in such cases the ore has been found to yield less per ton than in the other formation. The limestone is regularly stratified, and the greater number of the ledges run parallel to each other, crossing the stratification of the country-rock at right angles. The general course of the veins is from northwest to southeast. The character of the ores in the ledges is, in one portion of the district, that of "free milling-ores," while in the other "base-metal" ores abound, the latter being far richer than the former. These base ores consist of copper, lead, antimony, zinc, arsenic, and manganese, associated, in their several forms of chemical combinations, with the sulphurets and other ores of silver.

In 1866 a party of prospectors from Idaho, journeying to the then celebrated Blackfoot diggings, discovered "float" silver-quartz in the valley of Flint Creek, and returning the following autumn they went up into the foot-hills and found silver ledges cropping above the country-rock in every direction. They at once proceeded to lay out the district and record the ledges. During the winter the exhibition of ore from the Poor Man and other lodes, by C. W. Frost and others in Helena, caused considerable excitement, which culminated, early in the spring of 1867, in a grand rush to that camp, which was believed to be another "Washoe." The town of Philipsburgh, containing some three hundred houses, sprung up as if by magic, and some four hundred locations of ledges (?) were made, very many being "wild-cat." The Saint Louis and Montana Mining Company* erected a 10-stamp mill at an enormous expense, but owing to the company's complications the mill has run but a comparatively short time since its construction, having produced probably about \$250,000 in the aggregate. There were few in the county who understood the proper means of reducing refractory ore,

* From the Hope Mining Company, of Saint Louis, successor to the Saint Louis and Montana Mining Company, I have received a letter protesting against the statement on page 278 of my last (fourth annual) report, in which that company is charged with injuring the district by a system of "freezing out." The letter says: "Our companies are composed of honorable and prominent men, and we have expended nearly \$800,000 in money in Montana, not including interest. The property we hold was obtained by purchase, and we owe no debts. The various causes which led to a suspension of milling-work have not the most distant connection with a desire to 'freeze out,' falsely ascribed to us."—R. W. R.

and hence attempts to work those of a base character by the ordinary free-milling process resulted disastrously. Mr. Cole Saunders, in 1868, shipped 15 tons of base ores from the Poor Man's Joy lode to Newark and Swansea, which yielded \$300 in coin per ton, but owing to the excessive charges for transportation the shipment of ores was then abandoned. As the base ores could not be profitably reduced by the process adopted in the Saint Louis mill, it was concluded that they would therefore smelt, as they contained some galena. Mr. Saunders, with limited means and encountering many difficulties, erected smelting-works, consisting of two cupola and a cupelling furnace, using horn-blowers driven by steam-power. In the fall of 1870 the works were completed, but thirteen attempts to smelt the ore of the Speckled Trout mine resulted all disastrously, producing in the aggregate not over \$1,500; so this method was abandoned. The cause of the failure was the lack of proper fluxes. Saunders & Co. were bankrupt, with liens and mortgages resting over both mine and works, and in this condition the latter were leased to Colonel J. J. Lyon, who proceeded also without capital to take ore from the Speckled Trout mine, crush and ship it to Nevada and San Francisco, obtaining cash advances thereon from the First National Bank of Helena sufficient to pay current expenses. Becoming satisfied that the ore could be reduced in the district, and that the heavy transportation charges could thus be saved, he began converting the smelting-works into a dry-crushing mill. Unable to secure capital or machinery, and depending on credit alone, five wooden-stemmed stamps were made, also an amalgamating barrel of one ton capacity, and a wooden settler, while the cupelling furnace was changed into a reverberatory for roasting purposes. At length, with green and inexperienced men, the old Reese River process was tested in November, 1871, and proved more successful than had been anticipated, an average of nearly 90 per cent. of the sulphurets of silver being chloridized and saved by amalgamation. At the start 10 per cent. of salt was used, but experience has reduced this to 6 per cent., giving equally satisfactory results. The home-made machinery was imperfect, and not adapted to constant work. The cold weather of the past winter delayed operations. In the spring of 1872 arrangements were made by which the Saint Louis mill was changed, as far as practicable, into a dry-crushing mill, and furnaces were erected with drying-kiln, &c., attached *at the expense of the lessees*. Five hundred tons and over of Speckled Trout ore were run through at the rate of less than 5 tons per day, producing from \$125 to \$138 per ton. Twelve tons of ore from the same mine, and of no more than average richness, were recently worked by barrel-amalgamation, and yielded \$148 per ton. Efforts are being made to induce capital to invest in the Speckled Trout mine, for the purpose of clearing the incumbrances resting over it, and the erection of approved machinery to reduce its rich ores. Shipments of ore from the Speckled Trout mine to San Francisco yielded \$166 per ton. A small quantity sent to Reno yielded over \$190 per ton.

The Speckled Trout mine is the leading and richest mine in the camp, and is opened by a shaft, on the discovery, by a tunnel on No. 3 southwest, and also by an incline on No. 2 northeast. The ore has peculiar characteristics, which enable it to be readily distinguished from all others found in its vicinity. On discovery, where the principal work has been done, the dip of the vein is about 15° from a perpendicular. At the surface the vein is 7 feet wide and over; at the depth of 50 feet it is over 8 feet in width, and at the deepest working of the mine it is 9½ feet wide. At the surface the average assay of ore has been \$143 per ton; at the depth of 50 feet it averages \$155, while in the bottom of the

incline (deepest point reached) the average yield, by fire-assay, has been \$173 per ton. The main shaft is 85 feet in depth; from its top runs an incline, on the vein, at an angle of 45° , which intersects a level running northeast from the bottom of the shaft for 100 feet from it, and continues below this level some 26 feet. The ore on No. 2 northeast and 3 southwest is not so wide nor quite so rich as on discovery. On the former number the vein enters the granite, but the point of connection is not fully developed.

The Cliff.—This lode is located on the Front Hill, and crops out for a considerable distance. It is developed by a shaft of 60 feet in depth, and assays some \$70 per ton. Owned by Saint Louis and Montana Mining Company *et al.*

The Cliff Extension.—Developed by a shaft of 40 feet in depth; vein, 4 feet wide; assays (average) \$120 per ton; owned by Estell & Holland.

The Franklin lode, has several shafts sunk upon it; width about 2 feet; assays \$80 to \$100 per ton. Owned by Ullery & Merrill.

The Cordova, opened by a tunnel, about 3 feet wide, assays about \$50 per ton. Owned by H. Horton and others. This was the first lode discovered in the district.

The Comanche lode is called free-milling, but later developments show it to be of the baser class. Opened by tunnel on the vein over 1,000 feet and shafts on nearly all claims. It varies in width from 2 to 20 feet, and assays from \$25 to \$50; native silver (leaf) is found occasionally in this ore. Owned by Brown Brothers, Merrill, Saint Louis and Montana Mining Company, and others.

The Emma lode, opened by a shaft 60 feet deep, vein 6 to 8 feet wide, assays over \$100 per ton and is free-milling ore. Owned by Estell, Holland & Ullery.

Poor Man's Joy lode, opened by a cut 160 feet long, showing face of vein, has about 6 inches of ore, which assays over \$1,000 per ton. Owned by many persons.

The Pocahontas lode, located near the "Trout," crops out 800 feet, and is about 4 feet wide; opened by tunnel, running on the vein 64 feet; assays 75 per ton. Owned by M. L. Saunders, C. W. Frost, and others.

Kitty Clyde, on Trout Hill; 3 feet wide; assays \$40 to \$60 per ton, and opened by cut.

Potosi lode, opened by shaft 70 feet deep, vein 4 feet wide; assays about \$40, and is free-milling ore.

There are quite a number of other ledges which bid fair, if opened, to prove valuable, but the above are the principal ones which can now be classed as lodes.

There is an abundance of water for milling purposes in the district, and all the lodes are readily accessible by teams. The supply of wood consists of spruce and pine, and is sufficient for many years to come. Brick of a fair quality is made from clay obtained a mile from town. The valley affords a fine range for stock and is of sufficient extent to furnish subsistence for many herds. A fine road leads to Deer Lodge, and the district needs but machinery and capital to operate with, to annually add much to the silver production of the country.

The quartz-lodes of Butte City.—The following is a synopsis of a report on the quartz-lodes of the vicinity of Butte City by the late Professor James P. Hodge, geologist, which has been re-arranged and brought down to date, by Mr. Granville Stuart, of Deer Lodge City. These lodes have never been described in detail in former reports. At the present time, however, all discoveries of quartz-lodes, and especially of such

valuable ones, have acquired new importance from the fact that they can now be profitably brought to add to the product of the Territory.

Near the placer-mines of Silver Bow and Butte City are found some very promising veins of argentiferous copper and lead ores. The best of these are from one to two miles northeast of a remarkable conical hill on the north side of Silver Bow Creek, known as the Butte, which gives to the group of miners' cabins in the gulch near the veins the name of Butte City.

It is a peculiarity of the placer-gold found in this vicinity, that it is largely alloyed with silver; so that its real value is only about \$14 per ounce; hence, one would naturally expect the lodes or veins to be of an argentiferous character. A remarkable series of veins crosses the principal gulch or ravine of the neighborhood, about a mile north of the main branch of Silver Bow Creek, and about half a mile west of the east branch of this stream. The veins pursue a general northeast and southwest course, through a granite formation. Some are conspicuous quartz-ledges, rising prominently above the surface, the greater hardness of this material over that of the granite around having enabled them to better withstand the denuding and disintegrating agencies which have in the course of ages worn away the country-rock.

These quartz ledges sometimes present as their outcrop a fine display of copper-ores; others are marked by narrow naked belts or strips of ground, and still others by pieces of vein-stone and ores scattered along their line.

The lode called the Original is very remarkable for the extraordinary exhibition of green and blue carbonates of copper it presents for several yards in width, and for over 2,800 feet in length. The surface is almost completely covered with these ores. Along the line of the lead the appearance is as of a road over which the ores had been hauled and profusely scattered. By means of these croppings the line of the lead can be traced continuously for over half a mile, embracing the Original and Parrott lodes, which are, undoubtedly, both on the same great fissure. Below the surface on these lodes, red oxide of copper makes its appearance intermixed with the carbonates. These, as in other copper-mines, will be found mostly as surface ores, resulting from the effects of the atmospheric and other agencies upon the still richer oxides and sulphurets of copper of greater depths. Their abundance at the surface, and the great width of the veins in the shafts, give sure promise of large quantities of ore.

On the discovery claim a shaft has been sunk 14 feet deep, and in this the vein is seen well defined from 30 to 34 inches wide, consisting of green carbonate intermixed with red oxide. The walls are of granite and well defined, the south wall is hard, and the north or foot wall is soft and somewhat decomposed. The vein throughout both of these lodes dips to the south at an angle of about 80°.

On claim No. 3 east from discovery (each claim, and also discovery-claim, consists of 200 feet along the lode by about 100 feet wide) is a shaft 20 feet deep, in which the vein appears 4½ feet thick, and filled with fragmentary green carbonate of copper. The wall-rocks are very well defined, and of granite. The vein-matter in this claim is said to assay well in gold. On claim No. 4 east, is a shaft about ten feet deep, and it shows about the same vein-matter as on No. 3 east. On No. 5 east is a shaft about 16 feet deep, in which the vein-matter is solid and well defined, gradually widening as it goes down, until at the bottom of the shaft it is 2½ feet of green and blue carbonates, showing many fine specimens of native silver. On each side of the solid ore are 3 or 4

inches of "gossan," or iron-stained, decomposed vein-matter, and the wall-rock is a granite which is soft and partly decomposed, giving great facilities for sinking on the lode. On No. 6 east are two shafts, about 8 and 10 feet deep respectively, and about 40 feet apart, from which the surface-ores are said to assay as high as \$200 to the ton. At the bottom of the shafts the ores seem of about the same character as that of the claims before mentioned.

At or near claim No. 9 east, on the Original lode, the vein is supposed to connect with or run into the Parrott lode, for, as before stated, there is no doubt but these lodes are both situated on the same fissure.

The claims on the Original lode west of the discovery-claim are also very promising as far as claim No. 5 west, but not so well developed as those lying east of discovery. The course of the Original and Parrott lodes is N. 60° E. and S. 60° W. by compass, the needle varying about 21° east. The Parrott lode has a shaft sunk on No. 5 west of discovery, about 100 feet deep, in which the vein is about 2½ feet wide. Twelve inches on the south or hanging-wall are green and blue carbonates, while the other 1½ feet of ore are of a different character. This ore is said to be gold-bearing rock of good quality. There is a shaft on the discovery-claim about 24 feet deep in which the vein is about 16 inches thick, well filled with green copper ores, and well marked by distinct walls of granite.

There is also a shaft on No. 3 east of discovery-claim which is down 72 feet, and which shows about the same width and character of ore as discovery and No. 5 west. The owner of this claim has refused \$25 a ton for his ore on the dump. There is a shaft on No. 7 east, down 7 or 8 feet, exposing the vein, which is about the same in every respect as that shown in the other shafts. The assay for silver as seen below does not give so large a proportion of this metal as the ore of the Original lode is found to contain.

The Gray Eagle lode lies near the Original, and the indications are very strong that it is only a short branch or spur of that lode. For, at No. 4 east on the latter, the Gray Eagle is about 300 feet south, and its general course is such as to create the belief that it unites with the Original at or near No. 2 west and with the Parrott lode at or about discovery-claim, while the vein itself dips north towards the Original at an angle of about 40°. They will therefore probably unite at no great depth. There is a shallow hole sunk on the Gray Eagle in a gulch or ravine, which shows some beautiful ores of copper, and galena or lead ore. There seems to be a greater proportion of galena in this lode than in the Original, but working-tests will most likely prove the ores to be identical. On the discovery-claim on the Gray Eagle is a shaft, 8 or 10 feet deep in the soil and 12 to 15 feet deeper in the loose rubble. The green and blue carbonates and red oxide of copper appear in a streak about 8 feet below the surface. Under this the vein consists of a species of hematite, from 1 to 1½ feet thick, and is not very well defined. The iron-ore may be regarded the same as the "gossan" of the Cornish miners, which, with them, is considered a favorable feature when occurring on the upper or hanging wall. They have a popular saying that "gossan always rides a good horse."

About the east end of the Parrott lode begins another lode, called the Mountain Chief, which some think an extension of the Parrott, while others think it runs parallel to the latter. The vein is from 4 to 5 feet wide, but is not very well defined, and is of about the same appearance as the Gray Eagle, but it seems to contain no metal of any conse-

quence, except copper, of which the ore is claimed to contain about 65 per cent.

Another promising vein of argentiferous copper-ore is called the Moscow. It is opened on the summit of a high hill about 300 yards northeast from the Original. But little work has been done on the lode, the outcrop being sufficiently conspicuous to exhibit its surface-character. The course of this ledge is east-northeast, its thickness about 10 feet, the ores green and blue carbonate of copper, mostly concentrated in 3 feet on the southeast side of the vein. The chief exposure is on the discovery-claim.

The Buffalo lode is opened in a ravine some distance east of the Moscow. From the shaft have been taken considerable quantities of galena, which comes out in large masses evidently from a large vein. Intermixed with this ore are black and yellow blende (sulphuret of zinc) and pyrites of iron and copper. Such mixtures would be difficult to reduce, and will only be of value for the silver that may accompany them. By my own assay I found none of this metal in one sample, and in another a proportion equal to \$101 to 2,000 pounds of lead. Should further assays indicate the probability of suitable proportions of silver, no doubt need be entertained as to the sufficiency of the ore.

The Pacific Slope lode is a vein near the Original, of which the miners have a high opinion. The discovery-shaft is on the crest of a knoll, but presented nothing that attracted my attention as valuable. There are numerous veins of galena in this vicinity, some of which may prove to be sufficiently argentiferous to encourage their development, and at any rate they are likely to be of importance at some future time for furnishing lead to be employed in separating silver from the copper. They are not themselves so rich in this metal as some of the copper-ores. The proportion of silver obtained from some of them will be seen in the table below.

There are also a number of veins in this vicinity claimed to be auriferous only, to which I gave little or no attention.

Further assays are especially needed of the Parrott and Moscow ores, as these veins appear to be almost as promising as the Original lode. Of this last, numerous assays have been made by others, and, as far as I have learned, they all agree in giving a high value to the proportion of silver in the ore. Professor Eaton estimated the ore as worth about \$1,000 per ton for the two metals it would produce.

I have not estimated the proportions of copper nor of lead, for the ores obtained near the surface can hardly be regarded as fair representatives of what will be found below, while I have supposed the metal at greater depths, whether copper or lead, would be more uniform in its proportions of silver. Besides, there can be no question as to obtaining copper and lead ores enough. What is of consequence to ascertain is how much silver will these metals afford or yield to the ton. It may, however, be stated that the copper-ores may be depended upon to yield from 30 to 65 per cent. Some of them contain over 80 per cent. of the metal, and the galena will produce from 50 to 70 per cent. of lead.

Statement of the production in silver of the copper and lead obtained from the ores of the vicinity of Butte City, Deer Lodge County, Montana.

	Silver.
Original lode, 2,000 pounds copper, first assay, give.....	\$445 90
Do., 2,000 pounds copper, second assay, give.....	396 00
Gray Eagle lode, 2,000 pounds green carbonate, give.....	442 95
Do., 2,000 pounds red oxide, give.....	90 96

	Silver.
Gray Eagle lode, 2,000 pounds lead, give.....	\$77 69
Parrott lode, 2,000 pounds green carbonate of copper, give.....	47 37
Moscow lode, 2,000 pounds green carbonate of copper, give.....	83 19
Mountain Chief lode, 2,000 pounds red-oxide copper, give.....	172 44
Buffalo lode, 2,000 pounds lead, give.....	101 00
Mound lode, 2,000 pounds lead, give.....	63 17
Clara Moreland lode, 2,000 pounds lead, give.....	30 32
Wild Pat lode, 2,000 pounds lead, give.....	56 85
Harper lode, 2,000 pounds lead, give.....	19 00

Pine and fir timber is found near these lodes, but, to obtain it in great abundance, it would soon have to be brought from a distance of several miles. Forests of great extent and medium quality commence a short distance up the east branch of Silver-Bow Creek.

Moose Creek mining-district.—This mining-district is located in the southeastern portion of Deer Lodge County, and near the silver district known as Vipond, and the gold district of Highland. It is near the main range of the Rocky Mountains, and six miles from the Deer Lodge Pass, a good wagon-road leading to the main traveled road running through the said pass.

The Harvey, Day, and Ben Seymour lodes were discovered during the year 1867, and, during that and the succeeding year, were thoroughly prospected. These lodes crop out upon a high and abrupt elevation, which rises from the banks of Moose Creek. This stream affords an unfailing supply of water—during the melting of the snows in the lower ranges of the mountains as much as 1,000 inches, (miners' measurement,) and never less than 250 inches are available.

The original locators of these lodes first sunk a shaft, following down from the surface croppings, upon the Harvey lode; and, finding a well-defined vein of rich ore, they went below on the face of the hill and drove in a tunnel, which taps the vein at a depth of about 80 feet. At the point where the tunnel intersects the vein the ore is about 5 feet in thickness, and of a very rich and excellent quality. They then raised a shaft up through the ledge to connect with the opening from the shaft above. In so doing they developed a continuous vein of rich ore encased in granite, the same being from 3 to 5 feet in thickness, and gradually widening as it descends. It contains the richest and finest quality of silver ore ever found in Montana.

The quartz is what is known as free-milling ore, containing no base metals. It is full of rich sulphurets and chlorides of silver, and contains also ruby-silver. There are large quantities of the black sulphurets found all through the ore.

The average assay of all the rock removed is near \$400 per ton, the lowest being \$200, and reaching as high as \$3,500 per ton.

Some 200 tons of ore have been taken from the drift heretofore mentioned. Ten tons of first-class ore were sold to G. W. Stapleton at \$100 per ton on the dump, and hauled to Argenta, where the same was worked by the smelting-process, yielding about \$375 per ton. Ten tons were sold to S. H. Bohm & Co. for \$200 per ton on the dump, and also worked at Argenta by smelting. This lot yielded about \$400 per ton. One hundred tons of second-class ore were worked in a gold-mill at Red Mountain City, six miles from these mines, by Professor Swallow, and yielded about \$200 per ton.

A sufficient amount of work has been done upon the Day and Ben

Seymour lodes to demonstrate that they carry a vein of good ore of the same character as the Harvey lode, and of nearly the same thickness.

No work has been done since the year 1868, owing to continuous litigation among the owners of the property; but this has now been settled.

The present owners, W. F. Chadwick & Co., of Helena, Montana Territory, who have furnished this description of their veins, are now making application for United States patents for these lodes; and also for three mill-sites situate in front of the said mines and upon Moose Creek.

The rock from these lodes can be dumped from the tunnels directly into the mill to be erected upon the sites above referred to.

There is a great abundance of wood upon the unclaimed lands of the Government in the immediate vicinity of the mines.

By the kindness of Mr. H. L. Wolf, of Red Mountain City, I am enabled to give the following in regard to other lodes in this district:

The Dixie lode is owned by Parks & Dickey. It runs northeast and southwest, and lies in granite. There is an incline on it of 150 feet depth, which exposes good gold-quartz. During 1872 two men were at work on the vein, who have taken out and reduced 280 tons of ore, yielding \$14 per ton. Cost of mining and reduction, \$4 per ton.

The Canada, owned by Marceau & Lapointe, carries also gold-quartz. The course of this vein is north and south, the dip east as far as worked. An incline is down on it 125 feet, and tunnel, now in 400 feet, will tap the vein at a depth of 100 feet from the surface. Four men were employed in this lode during the year. The number of tons of ore taken out and reduced in arrastras was 300. The average yield per ton was \$18; the cost of raising and reducing, \$8 per ton.

The superintendent of the Nevins and Last Chance lodes, in Highland, has refused to give any information in regard to these lodes and their working.

Shortly after the close of the year twelve men were employed in these mines running levels.

The yield of the placer-mines in Highland Gulch during 1872 was only about \$1,700; that of Black Tail Gulch, (seven miles north of Red Mountain City,) \$1,400; and that of Moose Creek district, (Blue Gulch and Dodge Gulch,) \$2,000.

JEFFERSON COUNTY.

In this county the principal new developments of the year have been made.

It has been known for several years that rich veins of argentiferous galena, as well as of the true silver-ores, existed in various parts of the county. The erection of the new smelting-works at Helena, in the fall of 1871, however, first created a home-market for ores of that class, and many new mines were therefore opened, of which few of the best-developed are mentioned in the following:

For notes in regard to the new silver-mines, I am indebted to Messrs. B. F. Marsh, C. W. Higley, H. R. Comley, and the owners of the Legal Tender lode.

Jefferson district.—Alta California. Course of lode, northeast and southwest; length of claim, 2,200 feet; dip at an angle with the horizon of 40°; width of crevice, 9 feet; depth of shaft, 100 feet; tunnel, 200 feet long, strikes the bottom of shaft, running southwesterly on

the lode; amount of ore taken out during 1872, 300 tons; average assay value, \$70 per ton; specimens of pure galena assay \$216 per ton.

The War Eagle. Claimants, Embury & Company; length of claim, 1,500 feet; width of crevice, 3 feet; paying-vein, 6 to 8 inches; ore very rich; some chloride of silver, assaying \$400 to \$1,400 per ton, with galena worth \$150 to \$200 per ton.

The Gregory lode is 2,200 feet long; one shaft 150 feet deep, and two others, each 60 feet deep; also one shaft 40 feet deep; width of crevice, 4 feet; four tunnels, aggregate length, 350 feet; amount of ore taken out not less than 1,500 tons; ore, galena; value of first-class, \$125 per ton; value of second-class, \$70 per ton.

Minnesota lode. Length of claim, 2,200 feet; depth of shaft, 104 feet; there is also a tunnel 140 feet long; amount of ore taken out, 500 tons; value of first-class (galena) ore, \$100 per ton; value of second-class ore, \$60 per ton.

Mina lode. Length of claim, 2,200 feet; there is one shaft 150 feet deep on the lode; width of crevice, 4 feet. It contains milling-ore, except a vein 16 inches thick, of galena; average assay value, \$70 per ton; amount of ore taken out, 100 tons.

Little Giant lode. Length of claim, 1,500 feet; shaft, 65 feet deep; width of crevice, 4 feet; there is one tunnel, length not known; amount of ore taken out, 75 tons; it is galena, assaying \$175 per ton, and milling-ore, assaying \$100 per ton.

Michigan lode. Claimed by Kemp and others for a length of 1,500 feet; shaft, 80 feet deep; ore, galena, with milling-ore; amount taken out, 100 tons; average value, \$80 per ton.

There are many other lodes in this district recently discovered and undeveloped, but known to contain valuable milling-ores, yielding from \$50 to \$100 per ton.

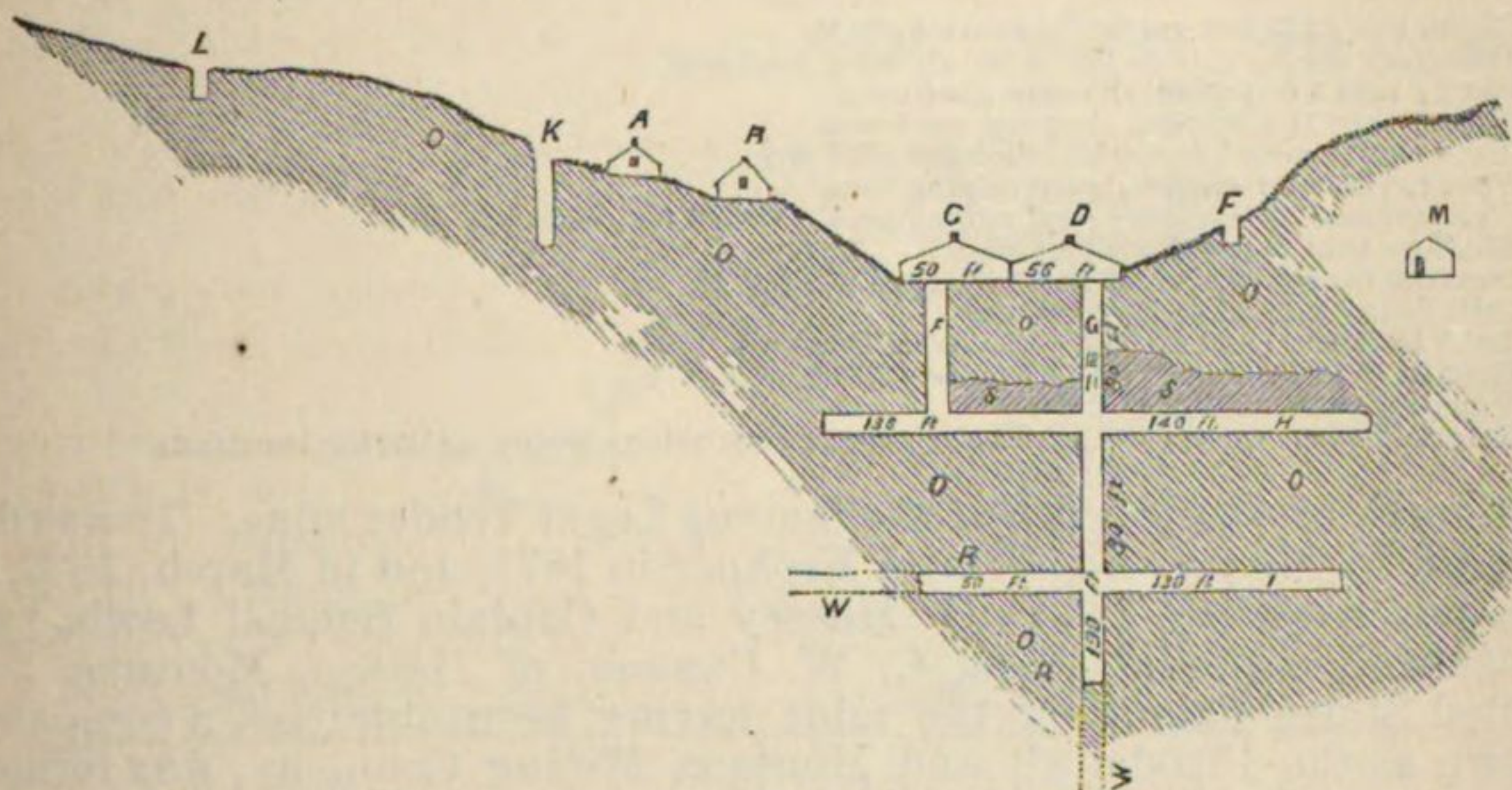
Hot Spring district.—The Legal Tender lode is situated on Prickly Pear Creek, opposite the mouth of Clancey Creek, in the Hot Spring mining-district, fourteen miles from Helena, and is owned by Messrs. Lewis, Bull & Co. This lode is a true fissure-vein, cutting through granite, and is considered the richest and best developed silver-property in the Territory. The ore and vein matter varies in thickness from 1 to 3 feet, increasing gradually in width as depth is obtained. A portion of the ore in the vein is a very rich argentiferous galena, carrying a larger or smaller quantity of dark-brown zinc-blende, sulphurets, and carbonates of lead, oxide of manganese, iron, copper, and antimony, with streaks in which native wire, flake, sheet, and ruby silver occur abundantly. The heaviest galena-ores contain black and gray sulphurets of silver, and yield from \$2,000 to \$4,000 per ton. A fine blue quartzose-ore predominates, in which occurs very frequently native and ruby silver. A small portion of these ores can be successfully reduced by the smelting-process, as has been demonstrated in the works at Helena and Jefferson City; but the larger portion of the ore from this mine can be most profitably reduced by the milling (roasting, chloridizing, and amalgamating) process. The lode was first discovered by Joseph Fultz in 1866, but no work of development was accomplished until 1872, under the management of its present owners, who came into possession in the winter of 1871-'72. Up to May 1, 1872, a shaft was sunk only to the depth of 60 feet, which, however, demonstrated the existence of a true vein, and a body of very rich ore. Since that time work has been prosecuted with vigor, and large and commodious whim, shaft, and ore houses have been erected, with company-office, assay-office, and other necessary buildings.

The mine is developed to the depth of 160 feet, showing an increasing width of vein with depth. At the depth of 80 feet levels were run 140 feet east and 90 feet west, and at the depth of 160 feet the east level is out 130 feet. Some stoping has been done east of the main shaft. An air-shaft 60 feet west of main shaft extends down to the 80-foot level.

From the commencement of work by the present owners up to January 1, 1873, the mine has produced 7 tons of ore yielding \$6,090, coin value, or at the rate of \$870 per ton; also, 130 tons of ore yielding \$54,000, coin value, or at the rate of \$417.78½ per ton; and 240 tons yielding \$31,607, coin value, in lots, at rates varying from \$128.42 to \$202.49 per ton. About 175 tons of second-class ore are now on hand.

Average number of men employed per day up to January 1, 1873, as follows: six miners, three windlass and whim workers, one bucket-filler and car-tender, three men assorting, cobbing, breaking, and sacking ore. Average cost of labor and board per day to the hand, \$3.09. Total cost of powder, fuse, and tools used, \$1,750. The hoisting is done by horse-power and whim.

The first-class ores have mostly been shipped out of the Territory in wagons to Corinne, thence to San Francisco and Europe.

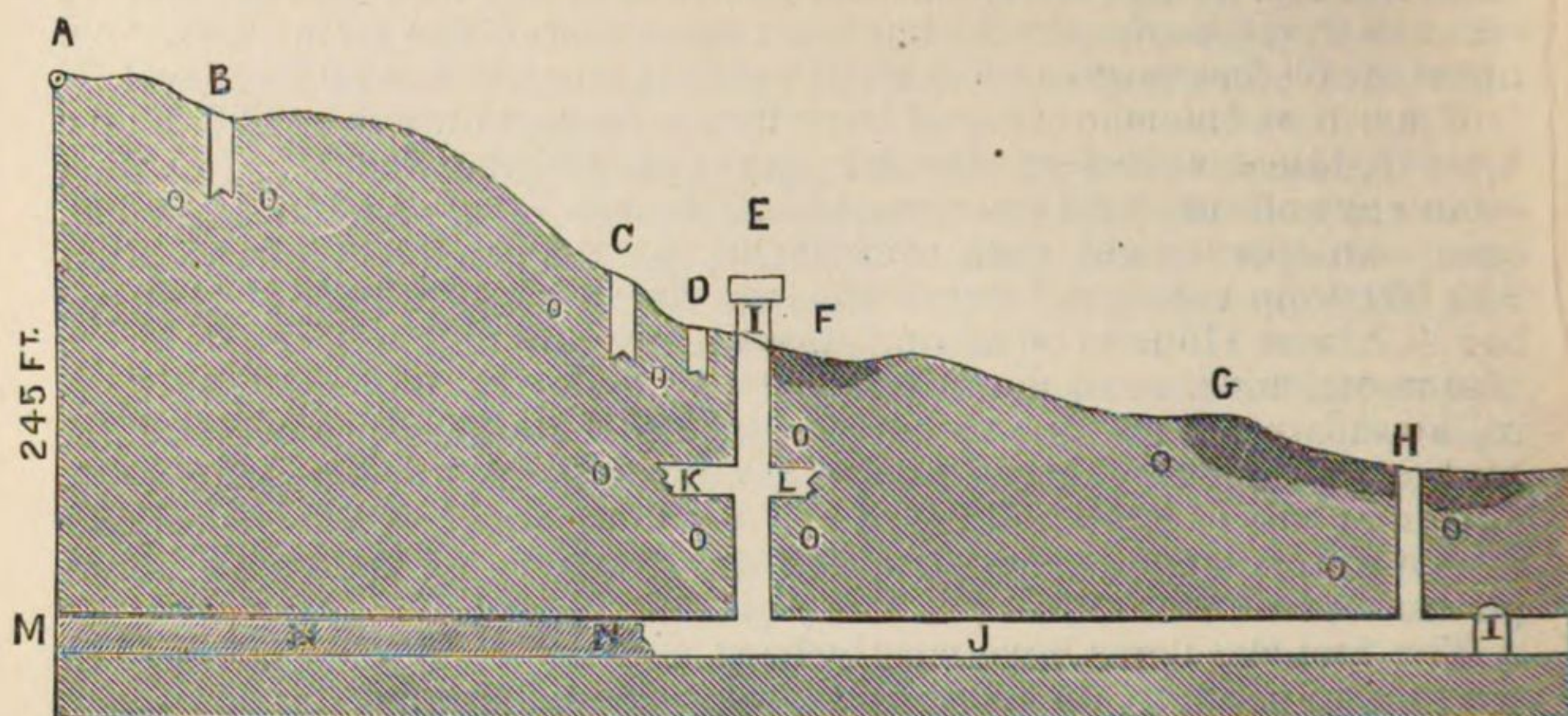


LEGAL TENDER LODE, CLANCEY, MONTANA.

Scale 100 feet to inch.

- A.—Assay-office.
- B.—Business-office.
- C.—Ore-house.
- D.—Shaft and whim-house.
- E.—Original discovery shaft. Ore assaying \$400 per ton.
- F.—Air and entrance shaft.
- G.—Main working shaft, vertical and 190 feet in depth.
- H.—Level 80 feet from surface.
- I.—Level 160 feet from surface.
- K.—Shaft on the vein 40 feet deep. First-class ore from surface, continuous.
- L.—Shaft on the vein 500 feet west of main shaft.
- M.—Magazine.
- O.—Ore not stoped out. (Reserves.)
- S.—Showing section of vein stoped out, which has paid the original purchase-money and all improvements on and all expenses of the mine, including boarding and sleeping houses, teams, &c.
- W.—Dotted lines, work in progress. The vein is vertical, and courses N. 77° E.
- R.—Body of rich ore just struck, February 1, 1873. Assay \$2,740 per ton of 2,000 pounds.

The Mammoth. This is a true fissure-vein, situated on the east side of Prickly Pear Creek in the Hot Spring district, near Clancey City, and



MAMMOTH LODGE, CLANCEY, MONTANA.

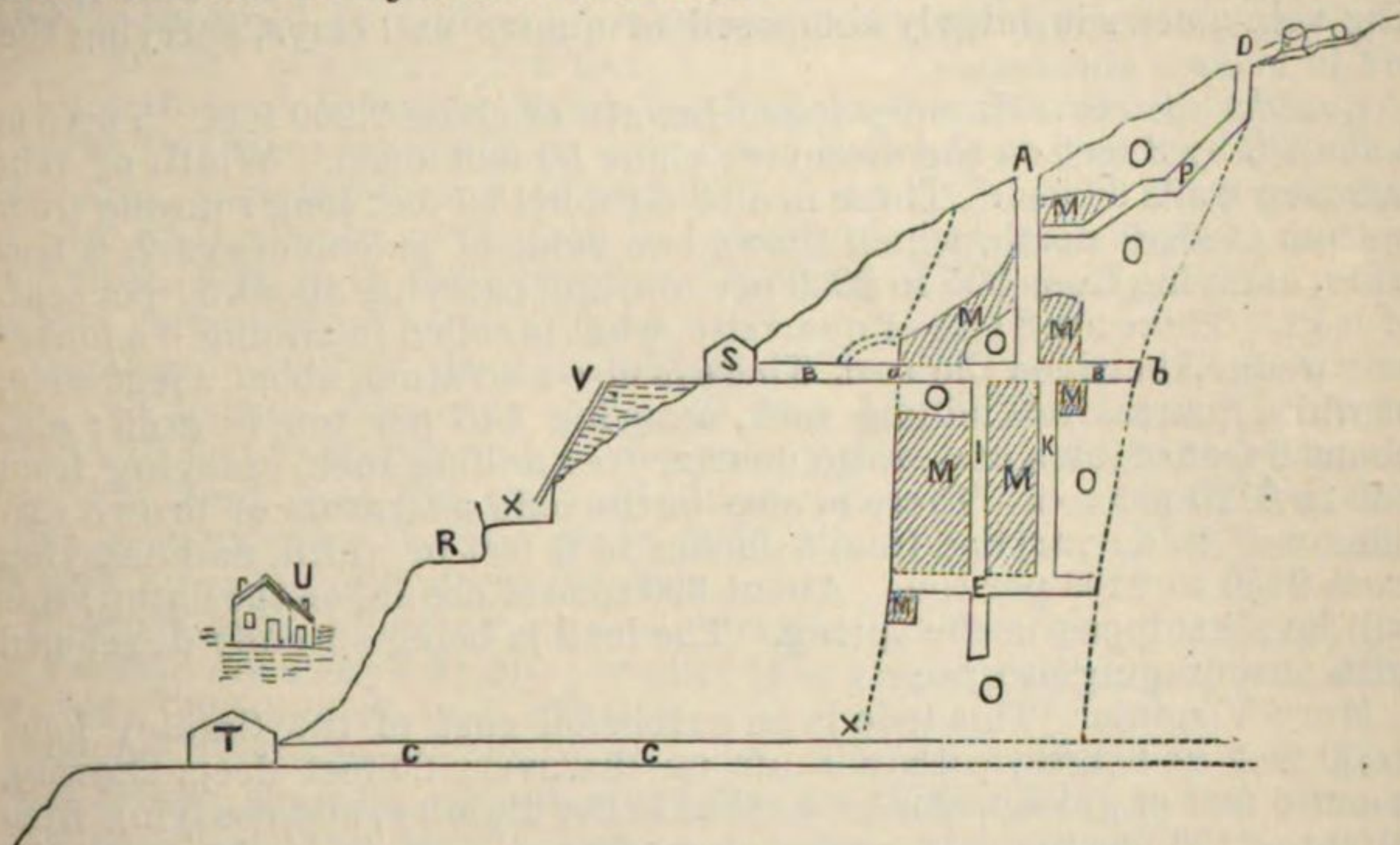
- A.—North line; 245 feet vertically above drift M.
- B.—Discovery shaft; vein $2\frac{1}{2}$ feet wide, showing good ores.
- C.—Shaft; vein 3 feet wide, showing good ores.
- D.—Shaft; vein $3\frac{1}{2}$ feet wide, showing good ores.
- E.—Main shaft; vein 5 feet wide, showing good ores.
- F.—Vein exposed on surface; good mining-ores.
- G.—Vein exposed on surface; good mining-ores. Vein 3 feet wide.
- H.—Shaft on vein 73 feet from surface.
- I.—Cross-cut tunnel or adit 165 feet to bottom of shaft H.
- J.—Drift from shafts H to E on the vein.
- K.—Drift in 23 feet; vein 4 feet. Choice milling-ores.
- L.—Drift in 15 feet; vein $3\frac{1}{2}$ feet. Choice milling-ores.
- N.—Proposed continuation of drift.
- O.—Reserved ores. Drifts and shafts show continuous veins, no stoping having been done.

one-fourth of a mile south of the famous Legal Tender mine. It was discovered by Messrs. Fisher and Frohner in 1871, and in March, 1872, it was purchased by Dr. C. G. Hussey and Captain Samuel Lewis, two Pittsburgh capitalists, and C. W. Cannon, of Helena, Montana. A United States patent for the mine having been obtained, a company, known as the Pittsburgh and Montana Mining Company, was formed under a charter from the State of Pennsylvania, and with its principal office at Pittsburgh, Pennsylvania. This company is now vigorously developing the mine.

The course of the vein is nearly north and south, and it dips at an angle of about 75° . In its course the ledge crosses large dikes or reefs of rocks that cross the country from east to west. The main shaft, passing for its entire depth through a good body of ore, shows $2\frac{1}{2}$ feet of good milling-ore at the bottom, which will yield \$112 to the ton. The crevice is at no point less than 5 feet in width, and has perfectly smooth and solid walls. These walls are of granite, as is also the country-rock of the entire district. When work was commenced upon this ledge it was supposed that it yielded only smelting-ores, and 128 tons of the ore first extracted, the average assay value of which was \$126 per ton, were sold to the Helena reduction-works for \$25 per ton on the dump. Twenty tons of second-class ore now on hand at the mine will average \$82 to the ton.

Further developments have proven the mine to contain free milling-ores, in large quantities and of a very rich character. At the depth of 46 feet drifts have been run north and south on the vein from the main

shaft. The face of the north drift shows a crevice 4 feet in width, 2½ feet of this being rich ore, 10 inches of which contain brown and yellow chloride, intermixed with decomposed honeycomb-rock, having an average assay value of \$762 to the ton. Specimens of the brown chloride have assayed as high as \$18,000 per ton. Commencing at a point 280 feet south of the main shaft, the ledge has been exposed on the surface for a distance of 75 feet, showing a vein 3½ feet in width, the ores from which are of the same character as in the shaft, and assay \$279 to the ton. An adit is now being run which will tap the vein at a depth of 135 feet from the top of the shaft, thus providing for drainage and giving sufficient stope to work for at least five years. The situation of the Mammoth mine, convenient to the best of water-power and with timber in abundance, adds greatly to its value. Some of the best farms in Montana, raising all kinds of grain and vegetables, large dairies and excellent stock-ranches, are in this immediate vicinity. The city of Helena, from which all kinds of supplies may be obtained, is but fifteen miles distant, the stage-road, from that town to Corinne, Utah, running within one hundred yards of the mine.



ARGENTUM LODGE, MONTANA.

The cut represents a diagonal cross-section of the lode, drawn to a scale of 1 inch to 100 feet. The average width of the vein is 30 feet; the diagram shows about 60 feet, because it is drawn in the vertical plane of the working tunnels, and not in the plane of the right cross-section.

D is the discovery shaft, connecting with the air-shaft A by the irregular incline P.

A is the original working-shaft, 63 feet deep at the level of the tunnel BB.

BB is the upper working-tunnel, 119 feet in length, cutting the hanging-wall of the lode at *a* and crossing the vein diagonally 75 feet to *b*.

I and K are two shafts, I 87 feet deep and K 67 feet deep.

CC is the lower tunnel, cutting the hanging-wall at X. This tunnel is at the present time 212 feet long, and is known as the *Fountain Head tunnel*, and is claimed under the last act of Congress.

S is a blacksmith-shop and ore-house.

V is a chute to conduct the ore to the bin X, where it is loaded on wagons on the wagon-road R.

T is an ore and sorting-house.

U is the boarding and lodging house.

O, ore.

M, stopes, ore removed.

Colorado mining-district is situated about twenty miles south of Helena. The principal mine is, so far, the Argentum, discovered November 18, 1866, by N. Merriman and Hershel Axe; but little work was done on it until February, 1872. The present owners of the portion now

worked, as shown by the diagram, are C. F. Anderson, W. E. Cullen, and Harry R. Comly. The lead is a true fissure-vein in granite, carrying argentiferous galena and true silver ores. Since February, 1872, there have been taken from this ground the following amounts of ore:

473 tons, first-class, yielding \$230 per ton	\$111, 090
250 tons, second-class, yielding \$96 per ton.....	24, 000

Total value in coin	135, 090
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This amount of ore has been taken out at a total expense of \$9,120.

The first-class ore is argentiferous galena, free from spathose iron or blende, carrying from \$140 to \$175 coin value in silver, and 78 per cent. of its weight in lead.

The second-class ore is a combination of galena, quartz, blende, and copper-pyrites, carrying from \$60 to \$75 coin value per ton in silver, and about 35 per cent. of its weight in lead. The course of the lode, as near as can be ascertained from the present workings, is N. 40° E., and the dip about 10° to 15° from the perpendicular toward the northwest. The vein-matter is largely composed of quartz and clays, carrying the ore in masses and seams.

Boulder district.—Rumley lode. Length of claim 2,200 feet. There is a shaft 6 by 8 feet on the discovery-claim 50 feet deep. Width of vein between walls 60 feet. There is also a tunnel 36 feet long running from bottom of shaft north, which shows two veins of galena-ore each 6 feet wide, assaying from \$65 to \$200 per ton, and carrying about 50 per cent. of lead. There are 8 feet of quartzite, what is called in mining "a horse" or "wedge," between the two. There is also a stratum, about 2 feet wide, of white quartz, free milling rock, assaying \$45 per ton in gold; also about 8 feet of blue and white quartz, free milling rock, assaying from \$40 to \$120 per ton. There is also in the lode a stratum of brown carbonate of lead, varying from 6 inches to 3 feet in width, and assaying from \$150 to \$400 per ton. About 500 tons of ore are on the dump; this will be all shipped in the spring. The lead is being speedily developed with encouraging prospects.

Mary Virginia. This lode is an extension east of the Rumley lode, 2,000 feet in length, with a shaft on discovery 20 feet deep, showing about 6 feet of galena, similar to that in the Rumley, and assaying from \$160 to \$150 per ton. It carries about 50 per cent. of lead. Only the south wall is defined.

The London is an eastern extension of the Mary Virginia lode, and is 2,200 feet in length, with a shaft 50 feet deep. Shows some lead, but there is nothing defined as yet.

Western Extension of Rumley lode. This lode is situated directly west of the Rumley lode, and is an extension of the same. Shows large deposits of galena, similar to the Rumley. Length of claim 2,200 feet.

North Pacific. Situated directly north of the western extension of the Rumley, and running parallel to it. There is a tunnel now being constructed to tap the western extension of the Rumley and North Pacific at about 100 feet depth. The tunnel at present is 200 feet long, and shows large deposits of galena, resembling that of the Rumley. The ore also assays about the same, carrying some 50 per cent. of lead. The tunnel has not yet reached to where the level dips perpendicularly. Length of claim 2,200 feet.

Silver Hill. Situated about one-half mile northeast from London lode. Shaft about 25 feet deep, crevice 2½ feet wide, carbonate ores, assaying

from \$200 to \$500 per ton. About ten tons of ore on the dump. Length of claim 2,200 feet.

Australia. Situated about 60 feet north of the Silver Hill, and running parallel to it; shaft, 30 feet deep; crevice, 2 feet wide; iron and lead ores. On No. 4 west a shaft 25 feet deep shows a vein of 3 feet wide, assaying from \$60 to \$150 per ton. Sixty tons of ore have been shipped the past summer. Length of claim, 2,200 feet.

Bismarck. Situated east of the Australia and Silver Hill lodes; shaft, 40 feet deep, shows vein 6 feet wide. Galena and milling-ores. A tunnel is run about 60 feet, tapping the vein about 50 feet deep. It shows a vein of about 5 feet, one-half of which is galena, and the other half milling-ore. A tunnel is now constructing from the east to tap the lode at the depth of 280 feet. Length of claim, 2,200 feet. There have been forty tons of ore shipped the past summer, and at present 10 tons of ore are on the dump.

Magna-Charta. Shaft on discovery, 120 feet deep. From the surface to the depth of 40 feet the crevice is about 4 feet wide, containing chiefly galena, assaying \$120 per ton. Below this the galena disappears, and is replaced by milling-ores, assaying in gold from \$40 to \$50 per ton. Length of claim, 2,200 feet.

Paul Jones. Situated about one-half mile north of the "Magna Charta." Discovery-shaft, 42 feet deep, showing $4\frac{1}{2}$ feet crevice. Galena ores, assaying from \$160 to \$200 per ton. On claim No. 2 east the crevice at the depth of 30 feet is 4 feet wide; ore from galena, assaying from \$150 to \$300 per ton. Length of claim, 2,200 feet. The galena carries 65 per cent. of lead.

Amazon. Situated about one-fourth of a mile southwest from the Magna Charta. Discovery-shaft, 45 feet deep. The vein varies from 5 to 10 feet in width, and carries chiefly galena and brown carbonate. In claim No. 2 west the crevice is 12 feet wide on the surface, and contains solid galena; average assay, \$150, silver, per ton, and 65 per cent. of lead. Length of claim, 2,200 feet.

Spencer lode. Shaft on discovery claim, 25 feet deep; crevice, $2\frac{1}{2}$ feet wide; ore assays \$1,010 per ton; it is galena, carrying 65 per cent. of lead; length of claim, 2,200 feet.

Fenian, Welling, and O'Connell lodes. Situated near the Spencer and Paul Jones; shaft on each about 25 feet deep; width of crevice from 4 to 6 feet, carrying chiefly galena, similar to the Paul Jones, but a change is indicated at the present depth to milling-ores; length of claim, 2,200 feet.

The Columbia is situated in the vicinity of the Paul Jones; the ore is entirely free from galena; the shaft will reach this winter 100 feet in depth; width of crevice, 4 feet; ore, free-milling quartz, assaying \$60 per ton at the present depth of 31 feet; length of claim, 2,200 feet.

Cedar Plains district.—In regard to this district, Messrs. Keating and Blacker have furnished me with the following information:

Names of lodes in and near Cedar Plains mining district, Jefferson County, Montana, (near Radersburgh,) on which work has been prosecuted during the year 1872.

Hidden Treasure lode, worked (and owned) by Messrs. Richards & Dodson.

Metropolitan lode, worked by Messrs. Webb & Cogshall.

Mammoth lode, worked by Messrs. Barclay, Nave & Co.

Bellevue lode, worked by Messrs. Chappel, Davis & Co.

Ironclad lode, worked by Messrs. Hallbeck, Nave & Co.

Allen lode, worked by Messrs. Hallbeck & Allen.

Left-Hand lode, worked by Messrs. Davis & Clancy.

Ohio lode, worked by Messrs. Keating & Blacker.

The amount of work done on these lodes I have no means of estimating. I only know that work has been prosecuted on them in 1872, by the parties named. Work is now going on in all the above, except the Ironclad and Allen, Left Hand, and Ohio.

On the Keating lode, the property of Messrs. Keating & Blacker, the work done in 1872 is as follows:

Number of lineal feet of levels run, 626.

Number of cubic feet of quartz stoped, 60,184.

Number tons of quartz taken out, 4,014.

Present condition of mine

Length of main level, 1,100 feet.

Length of lower level, 460 feet.

Depth between levels, 70 feet.

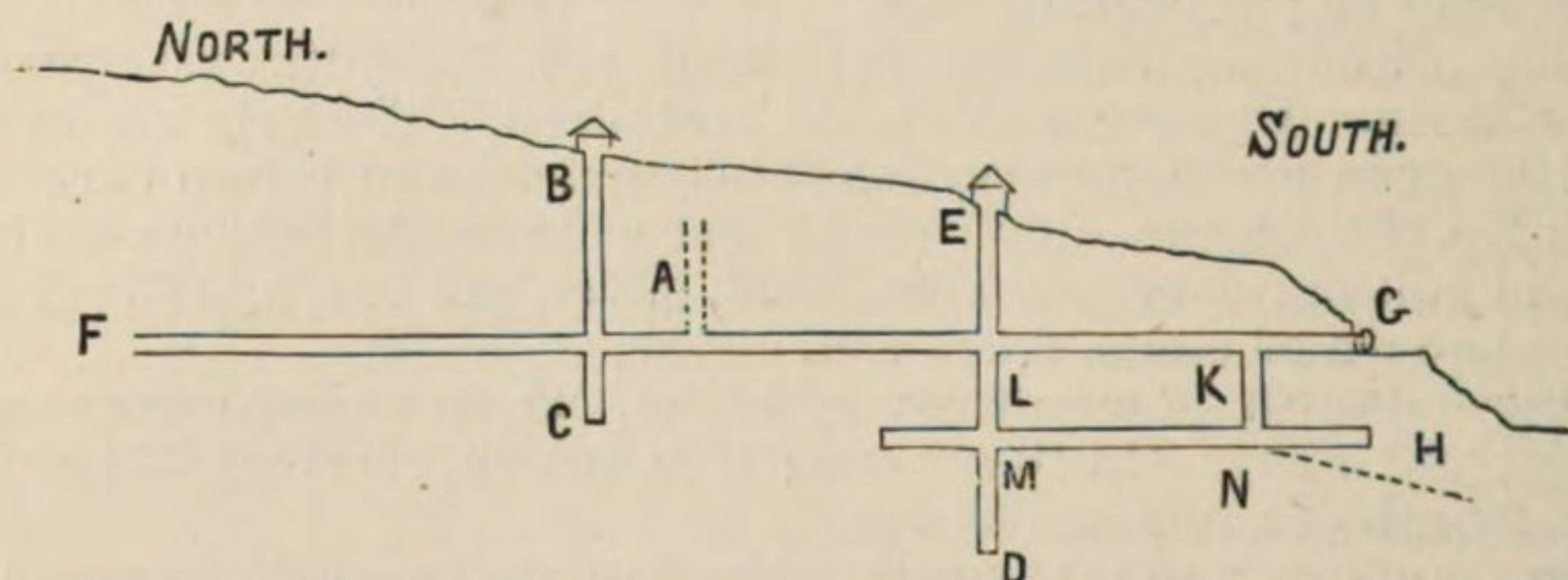
Depth of main level from surface, 90 and 100 feet.

Depth of south shaft from surface, 280 feet.

Depth of north shaft from surface, 150 feet.

Sulphurets in south shaft appear 140 feet deep from surface.

Work continuing in running levels and stoping. No sulphurets have so far been treated in the mill.



KEATING LODGE, CEDAR PLAINS MINING-DISTRICT, JEFFERSON COUNTY, MONTANA.

Scale 1 inch to 200 feet.

A.—Discovery-shaft, 90 feet deep.

BC.—North shaft, 150 feet deep.

DE.—South shaft, 280 feet deep.

FG.—Main level, 1,100 feet long.

MN.—Lower level, 460 feet long.

K.—Winze, 70 feet deep.

L.—Sulphurets commence.

EL.—Depth of free ore in south shaft; 140 feet from surface.

LD.—One hundred and forty feet, depth sunk in sulphurets.

NH.—Line of free ore, lower than at L.

General direction of lode, north and south; vein nearly vertical, dipping slightly to the west; walls well defined, of granite and slate. Quartz for crushing has been furnished regularly, since the summer of 1870, in quantity sufficient to keep a 15-stamp mill running. At H free ore of good quality appears; its depth from the surface seems to be increasing. Work progressing in lower levels at H and I, and in the stopes.

Silver Star district.—Mr. Thomas J. Johns, superintendent of the Everett Green Campbell Mining Company, writes in regard to this district:

Having had but little opportunity to familiarize myself with the results of the mining operations in this district during the past year, I will give you at least a brief summary of the work prosecuted by this company, which, though unsatisfactory, may be of some service to you in compiling your annual report.

Owing to the severity of the preceding winter, we did not resume work upon the Green-Campbell until May, of last year, having been idle about four months, when we erected a horse-whim for the purpose of "sinking" below our old tunnel-level, which at whim-shaft was 104 feet below the surface. We had previously mined and milled all available "pay" to this depth. Before suspending work for the winter, we "raised" a vertical shaft, 10 by 5 feet in the clear, from the tunnel-level to the surface, to better accommodate a whim; and in sinking, started our shaft at about the center of our old pay shute, on which we had placed our main reliance since first commencing work on the lode. At a depth of about 30 feet we lost our "pay," and penetrated a mixed mass of clay, barren quartz, and sulphurets, the latter not carrying free gold. The lead also widened considerably, and exposed occasionally small seams of galena-ore, which assayed largely in gold and silver. Aside from these changes the vein maintained its general features to the whole depth attained with the whim, being 120 feet, having at every point penetrated beautiful and well-defined walls, and a width of vein varying from 12 to 20 feet, with, however, an irregular dip. At a depth of about 60 feet water became so exceedingly strong that we were compelled to add another to the force of animals employed on the whim, making four shifts per day, and under a lively trot continually.

Under these disadvantages we sank a depth of 120 feet without penetrating "pay" in sufficient quantities, when we determined to abandon the work of sinking and confine ourselves to the work of "proving-up" the ground made accessible by the shaft. To this end we started drifts east and west from shaft, at a point 20 feet from bottom of shaft, which would have given us 100 feet of stoping-ground had we captured pay in said drifts. Having no inducements to go any considerable distance east, we soon stopped this, and pushed the drift west to a length of 100 feet, in the hope of finding our old pay shute, which had before shown an almost uniform dip west. Not accomplishing our object, we then connected this drift at its westerly terminus with our old tunnel-level above, by "raising" from below and sinking from above, in all of which work we did not obtain "pay" in quantities to justify its working; and having then effected all or more than a whim ought to do under such adverse circumstances, we concluded to suspend its operations and substitute a more fitting method of working the ground. And, finally, in view of the actual scarcity of skilled labor, and the exceedingly high price of all labor and supplies, the company has decided to "lay up their mine," and to suspend further work indefinitely, in the hope that the advent of railroads, or some near approach to civilization, will tend to facilitate the means of operating mines, and lend stronger encouragement to capitalists to risk the uncertainties of developing a quartz-mine.

The greatest depth attained on the "Green-Campbell" is now 230 feet. This company has not milled any ore since November, 1871.

Of the other leads in this (Silver Star) district, the Bedford, a small but rich crevice, has figured conspicuously. It was discovered about a year since by Charles Heinemann, and leased by him to the miners, who have worked it the past season with good success. It continues to look well at every point. Mr. Heinemann is the fortunate possessor of several well-defined leads, among which the "Morning Star" has gained much prominence, and I think deservedly so. But little work has been done on it the past season, the principal reason, I presume, being a lack of means. The work of "representation" is generally observed by resident-owners, yet, from appearances, I predict that many "feet" will be left to the unrelenting persecution of "jumpers." In fact, a general gloom seems to pervade throughout the length and breadth of the quartz domains, and really but little progress has been made in the development of quartz the past season, at least in this section.

LEWIS AND CLARKE COUNTY.

Ten Mile district.—Red Mountain, upon whose sides and spurs the mines are situated, is about sixteen miles southwesterly from Helena, and its summit is over 11,000 feet above the level of the sea. The principal stream, rushing by its base, is Ten Mile Creek, whose waters, running north and east, when they emerge from the cañon are taken up by a ditch and carried around and above Helena, and furnishing water to the placer-mines in Last Chance and Dry Gulches, and finally emptying in the Missouri River. Upon the east slope of the mountain other streams rise and flow northeasterly, spreading like a tilted open fan, the handle of which is the mountain proper. Around the base, and nearly to the summit, vast bodies of timber are seen, mostly of pine, spruce, and balsam-fir, which would give an abundance of fuel for several generations. The finest grasses in the world for stock-raising spread throughout the valleys, and thousands of animals could be raised and fattened on the hills and valleys contiguous to the mines. The numerous and never-failing streams which abound in the vicinity can be made to supply sufficient motive-power for dozens of blast-furnaces. The Northern Pacific Railroad surveys run along the westerly base of Red Mountain, crossing the divide which here separates the waters of the Atlantic and Pacific.

In 1865 prospectors, in searching here for gold, discovered galena in considerable quantities, but it was not thought to be of any value; hence nothing was done to develop the leads. However, good bar-diggings having been struck, there has always been a small gold-mining camp at Clarkson, twenty miles from Helena, and on the other side of the range, in Basin and Overland Gulches. Some few men, however, possessed with a mania for locating claims, have wandered all over the mountains, staking and naming every ledge that appeared to carry minerals. No work was done of any consequence upon any of the locations up to the passage of the new mining-law of May, 1871, and the passage of this act will ultimately prove of great benefit to the whole Territory, causing individual locators to drop their recorded interests in hundreds of claims, and consequently to let miners and capitalists work and develop the mineral wealth under foot.

The veins run in parallel bands across the mountain at no great distance apart. The lodes appear strongest east of the Ten Mile stream. Nearly all have a stake across the creek, which is shut in in several places by precipitous banks of a granitic appearance. The granite boulders and broken slides, with wash-gravel, show in places 1,000 feet above this, and cover up the leads so that prospectors have as yet only found the veins apparently strongest high up above the creek. This difficulty, combined with the rank growth of pine, grasses, numerous springs, and heavy timber, has prevented the finding of many leads believed to exist, hence a good field is still offered for the miner and explorer for silver or lead. Although granite and other crystalline rocks abound, the mountain proper is not granite, but of a sedimentary character; and at comparatively shallow depths the country-rock is found in nearly vertical layers, with bands of mineral, ranging from 6 inches to 17 feet in width, lying between. The colors are mostly of a light drab, approaching gray, except where the oxides have stained the walls. The shallow holes sunk by prospectors are mostly in granite or gneiss, and sand, having ferruginous veins interspersed throughout. The apparent course of the leads is northeast and southwest.

Le Mountain. Vein carries galena, carbonates, decomposed sulphu-

rets, with copper and antimony and iron-pyrites; assays from \$30 to \$250 per ton of 2,000 pounds; width, 17 feet.

Little Jennie. Dip of lead, vertical; width of vein, 16 feet; carries rich carbonate of galena and iron-pyrites; assays from \$50 to \$320 per ton in silver. Owners running a tunnel to tap and drain lode.

Bismarck. Depth of shaft, 40 feet; body of galena, 3 feet; carries \$70 to the ton.

Daniel Stanton. Width of vein, 3 feet; very pure galena on surface; yields \$150 to the ton in silver, and 70 per cent. lead. This, with some twenty-five other lodes, has been lately purchased by parties in New York, who are actively engaged in developing their claims.

Try Again. Depth of shaft, 55 feet; width of vein, 5 feet; character of ore, galena and pyrites; carries 40 per cent. lead, and \$100 to the ton in silver.

North Pacific and Little Emma. New locations taken up under new mining-law; both same vein; depth of openings, 10 feet; width of vein, 3 feet; galena, 15 inches.

Knight of Gwynne. Shows 8 inches galena.

Michigoma. Shows galena on surface; the vein is being tapped by a tunnel driven in about 300 feet.

Nearly all the leads can be worked by tunnel to good advantage.

In addition to the above there are numerous small veins found in the belt, which is about ten miles wide, and which show conclusively that the whole locality needs but practical miners and small capital to develop. Vast bodies of lead and silver bearing rock may thus be easily worked. Though the snow falls heavily through the winter, the climate, tempered by the warm Chenook winds, offers no impediment to successful mining operations. There are now six companies at work taking out ore.

MADISON COUNTY.

Brown's district.—This district is about four miles southwest from Virginia City. There are about one hundred recorded leads in it, one-fourth of which are believed to be good paying veins.

The principal lodes developed to any extent are the Pacific Railroad, Delton, Black, True Silver, Eumenia, Louane, Roma, Black Extension, Easton, Gould and Curry, Miners' Relief, and South Boise. The general course of these leads is north and south.

The Black lode is opened on each 200 feet for a distance of 1,200 feet, showing a well-defined crevice of quartz from 4 to 10 feet in width, assaying from \$30 to \$500 per ton. Discovery claim has been opened to the depth of 60 feet, and claim No. 4 north to about the same depth.

The Pacific Railroad lode is opened on different claims for 1,000 feet along the vein, the greater part of the work being done on the north half of discovery and No. 1 north. This claim is tapped by two tunnels, the lowest at a depth of 120 feet, with a shaft raised from the latter to the surface, and levels run along the vein for 170 feet. The width of crevice varies from 3 feet to 10 feet, the ore being very rich. There have been 1,000 tons of ore taken from this claim and worked in mills, furnaces, and arrastras. Part has been shipped to San Francisco and Europe, paying from \$60 to \$500 per ton.

The Louane lode is opened on several claims. On the discovery there is a shaft sunk about 60 feet, with a crevice 3 feet wide. The quartz assays from \$60 to \$500 per ton.

The Eumenia is opened on several claims, showing a crevice of 3 feet wide of good milling-ore.

The Roma is opened on the discovery claim by a shaft 125 feet deep, showing a crevice 18 inches wide, paying by mill-process \$125 per ton.

The Miners' Relief has a shaft sunk on discovery claim 30 feet deep. The crevice is 5 feet wide, and the ore is very rich.

The Black Extension lead has a shaft sunk on claim No. 1 south 30 feet deep, with a crevice 3 feet wide. The ore assays \$80 per ton on the average.

The Gould and Curry has a shaft on discovery 120 feet deep, showing a crevice 5 feet wide of good paying ore.

The Easton has a tunnel tapping the discovery claim. The crevice is 2 feet wide, and the ore assays from \$100 to \$500 per ton.

The Dalton lode is opened on the discovery-claim, and No. 2 north, to the depth of 30 feet, each showing a crevice 5 feet wide, of good milling-ore.

The True Silver lode joins the Pacific Railroad lode on the north. There are two tunnels on claim No. 2 north. The upper tunnel is 130 feet long, and taps the lode at a depth of 60 feet. The crevice averages 8 feet in width, with well-defined walls. The lower* tunnel is 200 feet long, and taps the vein 50 feet from the surface. It is well timbered, and has a good car-track and drain. At this point the vein is 15 feet wide, inclosed in solid granite-walls. The ore is free milling-ore, and averages \$178 per ton. There is plenty of timber and water for all purposes in the immediate vicinity.

All the lodes of this district carry true silver-ores, and all the silver-bullion contains from \$2 to \$10 of gold per ounce. Without mills for working the ore, or convenient markets, there is, however, not much inducement to work the veins at the present time; and the advent of railroads in the Territory is anxiously awaited by the miners.

Cherry Creek district was organized upon the discovery of several rich silver-veins during the winter of 1871. It is situated on Cherry Creek, an affluent from the east of the Madison River, and a little to the northeast of Virginia City. The district is not much developed, but rated very highly. So far, very rich ores have been found, the veins being usually of small size.

The Euselman is a 2-foot vein, carrying some native silver, but principally ores having the silver in combination with sulphur and antimony. Twenty-five tons of first-class ore are on the dump.

The Eberhardt, a 2-foot vein, has a shaft now down 83 feet. Fifty tons of ore are out. The owners intend to erect a 5-stamp mill, about a mile from their mine, and are preparing the site.

The Davis is a 6-foot vein, on which a shaft 40 feet deep has been sunk.

The Home, 2 feet wide, has been sunk upon by a shaft over 50 feet deep.

The few tests so far made of ores from these leads, indicate a richness of the ore of from \$75 to \$300 per ton. This is, of course, setting aside assays of selected specimens. A town named Havana has been laid out in the district.

* The terms "upper" and "lower," as here used by my correspondent, apparently refer to the position of the tunnels in the gulch, one being farther up stream than the other. It would otherwise seem absurd that the lower tunnel should strike the lode nearer the surface.—R. W. R.

MEAGHER COUNTY.

No work of any consequence has been done, during the year, in the quartz-districts of this county. Mr. J. E. Hall, of Diamond City, is my authority for the following statement in regard to the mining-industry of this part of the Territory.

Mr. Hall thinks \$350,000 a just and nearly correct estimate of the amount of gold taken from the placers of this district during the year ending January 1, 1873.

A great many copper and silver lodes have been located and recorded; but as very little work has been done, it is impossible to say how many of these locations are even on true veins.

On the head-waters of the Mussel-Shell River a number of lodes, containing copper, have been located. One of these is the St. John, located, in 1866, by Messrs. Hall & Hawkins for the Rocky Mountain Quartz Company. A shaft has been sunk on this lode to a depth of 70 feet. The ore assays from 40 to 75 per cent. copper, and, so far, has shown a small percentage of gold. The vein on which the St. John is located can be traced on the surface for about three miles, and several other locations have been made upon what is supposed to be the same vein. Of these locations the St. John and Ohio lodes have been patented by the Rocky Mountain Quartz Company.

The amount of quartz on the dump in the Mussel-Shell district is small, some of it having been hauled away and sent to the States. The reason why more work has not been done in this district is the exposure of the locality to attacks from Indians. The expense of transporting the ore has also retarded development.

Some locations have been made on Birch Creek; the ore assayed from \$60 to \$100 per ton in silver, one specimen running as high as \$1,500 per ton. As yet there has been no work of any consequence done in this district, no shaft having been sunk to a greater depth than 10 feet. Some men are working there this winter, however, and by spring something more will be known concerning the mines. The ore of Birch Creek district is milling-ore.

Some lodes of argentiferous galena have been located on Greyson Creek; but, since no work has been done before this winter, I am unable to give any information concerning the mines. From present appearances the prospects are not particularly good.

There are other localities in this county where there are croppings of silver and copper ore to be found, but no work has been done as yet.

CHAPTER VI.

UTAH.

The general results of the mining industry of this Territory have been very satisfactory during 1872, and a considerable increase in the production of lead and the precious metals over that of last year testifies that the preliminary stage of speculative talk is passed, and that earnest work has been fairly begun.

The mineral resources of the Territory are very great, and the facilities for utilizing them are superior to those of almost any other Territory. I have devoted considerable space in my last report to the discussion of the advantages which Utah has in starting her mining industry at the present time, thus being able to profit by the experience of her neighbors, and I need not recur to them here. Nor is it necessary to repeat an elaborate description of her mineral deposits; and I shall confine myself in this report to a brief account of the progress of the leading mines and smelting-works during the year, together with an exhibit of the production in the whole Territory.

The following statement of the product of gold, silver, and lead of the Territory of Utah, during 1872, has been made up with care from authentic sources. I am particularly indebted for most of the data to Mr. George J. Johnson, of Salt Lake City, who, favored with the courteous co-operation of the various officials of mines, smelting-works, and railway and express companies, has procured for me the most trustworthy returns which the circumstances would permit:

Base bullion, (lead, silver, and gold,) 8,125 tons, produced as follows:

Flagstaff Works, 3,000 tons, at \$250	\$750, 000
Miller Works, 1,536 tons, at \$178.21*	291, 840
Winnemuck Works, 1,232 tons, at \$286.97	353, 551
Utah Works, 650 tons, at \$125	81, 250
Saturn Works, 1,207 tons, at \$233.07	282, 287
Wahsatch Works, (approximately,) 150 tons, at \$250	37, 500
All other smelting-works, (estimated,) 350 tons, at \$250	87, 500
Silver shipped by express, 170,191 ounces, at \$1.18	200, 825
Gold bars and dust shipped by express, 5,556 ounces, at \$18	100, 008
Ore shipped, according to Utah Central Railroad, 20,693,692 pounds, worth in gold and silver \$88 per ton	910, 523
30 per cent., or 6,208,107 pounds, of the above ore may be assumed as lead, worth 2½ cents per pound in the ore....	155, 203

Total value of gold, silver, and lead	3, 250, 487
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To obtain the product of the Territory in gold and silver alone, there should be deducted from the aggregate the value of the lead, viz:

8,125 tons of unrefined lead, at \$80	\$650, 000
6,208,107 pounds of lead in the ore, worth 2½ cents per pound	155, 203
	805, 203
Total gold and silver	2, 445, 284

* The value of the Miller bullion is calculated from the report of the superintendent, which gives \$110 per ton as the value in currency of the gold and silver in this bullion, to which \$80 is added, as the value of the unparted lead, at 4 cents per pound.

The items of base bullion in this statement are given in currency, but the currency price at Salt Lake is not far from the probable yield in coin value after refining, and hence may be taken to represent in this instance the actual amount of gold and silver added to the world's available stock, which is the object of inquiry.

From the published statements of shipments by the Utah Central Railroad and Messrs. Wells, Fargo & Co., and the report of the Germania refining-works, communicated to me by H. Engelmann, M. E., of Salt Lake City, the following figures are arrived at:

Ore shipped, 20,693,692 pounds, estimated worth in silver and gold \$88 per ton.....	\$910, 523
Base bullion shipped, 11,066,853 pounds, worth in gold and silver \$151.87* per ton.....	840, 360
Base bullion bought by the Germania refining-works, 925 tons, worth in gold and silver \$151.87 per ton.....	140, 480
Silver shipped by express, according to Wells, Fargo & Co., of Salt Lake City, 170,191 ounces, at \$1.18.....	200, 825
Gold shipped by express, according to the same source, 5,556 ounces, at \$18.....	100, 008
Total gold and silver.....	2, 192, 196

To this may be added for lead:

11,066,853 pounds, shipped as base bullion, unrefined, at 4 cents per pound.....	\$442, 674
1,670,000 pounds on hand, unrefined, at Germania refining-works, at 4 cents.....	66, 800
180,000 pounds, refined, shipped by Germania Works, at 5 cents.....	10, 800
30 per cent. of amount of ore shipped=6,208,107 pounds, at 2½ cents.....	155, 203
	675, 477

Total apparent product of metals..... \$2, 867, 873

In comparing the number of tons of base bullion shipped, and the amount bought by the Germania refining-works, as per last statement, with the total number of tons reported by Mr. Johnson as produced in the various works, it is seen that 1,666.5 tons more have been produced than shipped. At the end of the year this base bullion must, therefore, have been at the different furnaces and in transitu to the railroad. If we add the silver value of these 1,666.5 tons at the above average valuation per ton, viz, \$151.87, to the total amount of gold and silver in the second statement, we have:

Total gold and silver shipped, or bought by the Germania works.....	\$2, 192, 196
Add 1,666.5 tons, silver and gold value \$151.87 per ton....	253, 091
Total.....	2, 445, 287

Mr. J. J. Valentine, superintendent of Wells, Fargo & Co., at San Francisco, in a statement published shortly after January 1, 1873, gave the product of Utah for 1872 as follows:

* Average obtained from the foregoing statement.

Gold by express.....	\$415,166 77
Silver by express.....	365,285 32
Ores and base bullion.....	2,740,568 00
Total.....	3,521,020 09

This statement gives Utah credit for over one million more than she has really produced in gold and silver. There are large errors in all three items, about half a million being caused in the first two alone, by including the express shipments of coin as part of the produce of the Territory. The large overvaluation of ores and base bullion must be referred to the difficulty of obtaining exact figures so early in the year.

During the summer and fall the mining and smelting business in Utah was highly favored by the extravagant prices paid at Salt Lake for both ores and bullion, by the competing agents of rival establishments, particularly in Saint Louis and Chicago. These agents may understand better than any outsider what they are doing; but it certainly seems as if they could not have maintained a profitable business and paid for their crude material so recklessly. A couple of examples will illustrate my meaning.

In July thirty tons of bullion from the Saturn smelting-works, near this city, were sold to the highest bidder. It contained by assay 99.16 ounces silver and 0.3 ounces gold per ton. The price paid by the agent of the Chicago Smelting and Refining Company was \$231.31 per ton. Assuming the value of the lead at Salt Lake City at $4\frac{1}{2}$ cents per pound, (which is liberal,) and reckoning \$6.20 per ton for the gold, this would be \$1.41 paid in Utah for each ounce of silver, or, looking more closely into details, at \$1.34 per ounce, the silver would be worth per ton of bullion in Chicago, after separation, \$132.08 coin or \$151.52 currency. The lead, at 7 cents, would be worth \$140, and the gold, say, \$4 net. Total, \$295.52, value of bullion per ton in Chicago. On the other side of the account we have the price, \$231.31, paid for the bullion; freight to Ogden, \$2.50; to Omaha, \$20; to Chicago, \$6; total freight, \$28.50; cost of treatment, say \$12 per ton; loss, say 5 per cent., or \$11.50 per ton; total cost, \$283.31, leaving a margin of only \$12.21 for commissions, interest, risk, and profit. This margin, I think, any metallurgist would consider dangerously small for the time and place.

The same establishment has been buying ores in the same style. Two hundred tons of Emma ore were sold, assaying 67.8 ounces silver per ton, and 47.5 per cent. lead. For this ore the agent of Selby's San Francisco works bid \$64.53 per ton; other parties bid \$70 and \$72, but the Chicago works carried it off at \$84 per ton! Add to this the freight (\$25 for ore,) smelting cost, \$20, refining, \$12, and loss, \$14, and we have a total of \$155 paid per ton. The silver at \$1.34 and the lead at 7 cents, amount together to \$157.35, leaving a margin of \$2.35.

A later sale of Emma ore, made in August, was even less favorable to the buyer. The amount was 100 tons, assaying 67 ounces silver per ton, and 48 per cent. lead. It was bought for Saint Louis at \$85.50, leaving, according to the figures above given, only 48 cents margin per ton. Silver was probably worth, at that time, more than \$1.34 gold per ounce; but this difference is not enough to render smelting at these figures an inviting business.

Such fierce competition was evidently unsound. It was a struggle among rival concerns to gain possession of the whole Utah market; and it was safe to prophesy that it would result either by the triumph of one party or the exhaustion of all, in a reaction of prices to a level more

in agreement with business caution and permanent success. Meanwhile such a state of affairs furnished, of course, a rich harvest for the ore and bullion sellers of the Territory.

Big and Little Cottonwood districts, especially the latter, still hold the most prominent position among the Utah mining-camps. The Emma and Flagstaff mines, both now in English hands, have probably furnished more ore than any other two mines in Utah.

The Emma, in which a very large chamber had been excavated during the previous summer and during the earlier months of 1872, unfortunately experienced a complete caving in of the hanging-wall in the early spring, when the rapid melting of the heavy snow of the previous winter had filled the limestone with floods of water, loosening its texture and bringing an enormous weight on the timbers in the large chamber. It is always difficult to timber such large open spaces, and in this case the mistake had been made of putting in the timbers not at right angles to the strike of the walls, but so that the weight would fall obliquely on the points of junction of the uprights and caps.

After the cave, the large chamber was one inextricable mass of broken timbers and loose masses of rock, so that it was deemed best not to disturb this part of the mine any more, especially as nearly all the valuable ore had been taken out. Starting at a point in the main working-tunnel leading to the surface, a short distance from the caved portion of the mine, a drift was cut around the whole of the east side of the old chamber, which connects with the corresponding level of the new workings, northwest of the old ones. A shaft 136 feet deep had here been sunk, not far from the northwest end of the location, which struck a second body of ore connected with the older body, as plainly visible in several levels. Upon this connection of the two bodies turned the decision of the courts in the matter of the Emma Company against the Illinois Tunnel Company, (which had reached the second ore-body by a tunnel,) the first praying for an injunction against the latter, which was obtained. Immediately after this had been accomplished, the obstructions put into the connecting level between the old and new bodies by the Illinois Tunnel Company were removed, and further connections by means of lower levels were made. Most of the ore then mined was obtained from the new body and raised through the new shaft, from which levels started at depths of 40, 100, and 136 feet from the surface respectively. At that time, August, 1872, the new working-drift around the caved-in part of the mine was being timbered heavily, and no ore, or very little of it, could be brought through it. There were nineteen floors, (a little over 7 feet high each) above the level of the main tunnel, and sixteen floors below. The shaft sunk below the tunnel-floor was, however, not accessible, except for a short distance, the lower part being still filled with water from the spring-floods. From the bottom of this shaft the superintendent reported unusually rich ore had been taken before the disaster, and a great deal of the same kind was said to be still standing. The pump then in the shaft was a very small one, and not at all adequate to the requirements of the case. There was a very large amount of carbonate-ore standing in the mine, especially in the newly-developed ore-body, and some new ore had been met with in cutting the drift mentioned above, in what had formerly been supposed to be the hanging-wall of the old body. The superintendent thought that after the timbering was finished, 50 to 75 tons of ore could, without difficulty, be shipped from the mine. The Emma Company shipped to England, from January 1 to August 15, 4,000 tons of ore. From that

time to January 1, 1873, they sold in open market, at Salt Lake City, 6,300 tons, thus making a total product of the mine of 10,300 tons.

At Salt Lake, an average price of \$70 currency per ton was obtained, the ore assaying on an average 69 ounces of silver per ton, and 45 per cent. of lead. The ore sent to England was of somewhat higher grade.

The above figures were kindly furnished by Mr. George J. Johnson, of Salt Lake City, who obtained them from the company's books.

Concerning the notorious litigation between the Emma and the Illinois Tunnel Company, little need be said in this place. One legal point involved appears to have been the right of a patentee to follow his vein outside of the limits of the survey in course as well as in dip; and the decision of the court, asserting this right, seems to be contrary to the spirit and letter of the law. But the peculiarities of the Emma deposit, which is not a regular vein, and the other points in the case, make it a text unsuited to general comment. The doubtful character of the decision is shown by the confessed payment of a large sum by the Emma Company to the Illinois party, in consideration of which, it is said, the latter agreed not to appeal or further prosecute the case. The location of the Emma survey along an axis crossing the known axis of the ore-deposit, is a circumstance casting suspicion on the former but not the present owners. It is to be lamented that the English stockholders of this company have encountered so many foreseen and unforeseen difficulties.

The Flagstaff has been worked very energetically since it came into the hands of an English company, and much credit is due for his good management to the superintendent, Mr. N. M. Maxwell. The following extract from the London Mining World, based on the report of one of the directors, Mr. Frames, who was sent out from London to inspect the mines and furnaces in the summer of 1872, contains the principal facts of interest in regard to the condition of the property at the time mentioned:

The Flagstaff mine is situated at the head of Little Cottonwood Cañon; the road ascends 4,000 feet from the entrance of the cañon, where the Flagstaff furnaces are located. The ore-house is about 400 feet above Alta City, and receives the ore by tram-way from the present tunnel-entrance, about 1,000 feet above it. The vein of ore, inclosed by its walls of rock, is sharply marked to the most unpracticed observer, and from actual measurements of the ore in sight at the three lower levels, taken at the request and in the presence of Mr. Frames, there are 192,540 feet, averaging the width of the lode at 3 feet. The ore in weight is estimated at 9 cubic feet to the ton, which would show 21,383 tons; and on the same data, for the two upper levels of the old workings, where there are large quantities of good ore in sight, it does not seem excessive to regard them as making up the total to 30,000 tons.

The ore falls from the stopes above the present tunnel, and is lifted by a mule from below it into cars that convey it on a tram-way to the tunnel-mouth, where it is sacked and sent down the incline to the ore-house. At these two points there were about 60 tons ore, besides 400 tons at the furnaces. It is intended to have a stock of 6,000 tons at the ore-house before winter sets in, to provide for work being interrupted on the incline by snow. About 600 feet below the present tunnel a new one (called the Maxwell) has been started, and will be carried through the mountain into the adjoining cañon of Big Cottonwood, where there will be an eligible point of egress. If the lode continues in its present direction the tunnel is expected to strike it at 800 or 900 feet from its mouth, at a depth of about 450 feet from its intersection with the tunnel above. The prosecution of this important work will take some time—probably eighteen months—before meeting the lode, but success in its aim, or in making other discoveries on the way, would establish a multiplied value of the property.

The road in the cañon had been put in tolerable order just before Mr. Frames's arrival. A subscription of £3,000 had been raised for road-purposes from several of the larger interests, the Flagstaff contributing £300. One-fourth had been paid, and was in course of expenditure. The remainder is reserved for next spring. The transport-service is under contract with responsible men, at \$7.50 per ton in summer, and \$8 in winter, to haul, as required, 50 tons per day to June 1, 1873, from the mine to the fur-

naces. No difficulty is feared by the contractors or by Mr. Maxwell from the winter, as the sledge will be substituted for the wagon over the snow, and interruption is only looked for in May and June, when the snow melts. In the neighboring cañon of American Fork a line of rails has been laid down, and it is probable that before long engineers will be able to face the difficulties of Little Cottonwood. The daily freight of ore down the cañon is so great as to compel some solution. On the transport of 50 tons per day, that may be expected, at a tram-road rate of 10s. per ton for the ten miles, there would be a saving to this company of £15,000 per annum.

The mine is capable of sending down 50 tons of ore per day at a slight increase of cost, but the two furnaces, up to the date of Mr. Frames's arrival, had only consumed 20 tons of ore per day. Later returns show an increase, but the proper co-operation of the mine and furnaces must wait for the third furnace—hot-cylinder blast—the machinery of which has since arrived from Pittsburgh. It is expected to double the production of bullion, or to turn out reliably 18 to 20 tons per day in all, and also to treat low-grade ores of 20 per cent. profitably. For the three months ending September 15, 1,467 tons ore produced 619 tons bullion, or $2\frac{3}{4}$ to 1, but, during Mr. Frames's presence, he understood that poorer ores from the older works were being sent down from the mine, and the returns for the next five weeks, ending October 13, show 1,167 tons of ore to produce 326 tons bullion, or $3\frac{1}{2}$ to 1. These differing results suggest also an imperfect action of the furnaces, which the new furnace may be expected to remedy. Former difficulties in the supply of charcoal appear to have ceased. A good contract exists for 1,500 bushels per day, or more at option, at $30\frac{1}{2}$ cents per bushel, deliverable at the furnaces, quality to be approved on arrival; purchases made of other burners at 24 to 26 cents, on the same terms, reduce the average cost to about 29 cents. Stock on hand 65,000 bushels, and the contractor states his reserve at a railway-station in the Territory to be 100,000 bushels, besides the same quantity in preparation; altogether an ample provision for the winter. It is expected that coke will be economically used instead of charcoal for the new furnace.

The smelting-works, the houses of Mr. Maxwell and the chief smelter, the boarding-house for the men, and the office are located on a tract of ground of about 16 acres belonging to the company. The water-power for the smelting-works is supplied to a ditch from the stream that runs down the cañon, which is ample and constant.

The distance of seven miles from the railway-station of Sandy is an element in the cost of the bullion before it reaches a market, and of charcoal and other supplies for the works. It is hoped that before long this charge will be reduced to a railway-rate. The granite for the Mormon Temple, building at Salt Lake City, is all obtained at the entrance of Little Cottonwood, and a railroad is being made to carry the granite blocks to Sandy. A branch of a few hundred yards will connect it with the smelting-works, and on the larger transport required for three furnaces, will lead to a saving of £4,000 to £5,000 per annum.

A railroad through Little Cottonwood Cañon has, since the publication of the above, been reported as feasible, and the work is said to be partly under contract.

Mr. Maxwell has kindly furnished me the following :

Reserves on December 31, 1872, 26,000 to 30,000 tons of gray and yellow carbonate ores, $3\frac{1}{2}$ tons of which make 1 ton of base bullion. The metal being produced about that time assayed 157 ounces of silver and \$50 gold per ton. Cost of smelting about \$55 (?)^{*} per ton.

The product of the Flagstaff furnaces during 1872 was 3,000 tons of metal, containing—

Silver	\$390, 000 ; average per ton, \$130.
Gold	120, 000 ; average per ton, 40.
Lead	240, 000 ; average per ton, 80.
Total	750, 000

The capital of the company is £300,000, on which 30 per cent. in dividends have been paid during the last three months, and 24 per cent. during those preceding; the total amount of dividends paid being £76,500.

Of other mines which have held a prominent place in Little Cotton-

^{*} This estimate probably refers to the production of one ton of base bullion, and not the cost of smelting one ton of ore.

wood Cañon, the Davenport, Vallejo, Wellington, Savage, Montezuma, and Hiawatha, have especially maintained their good reputations.

The Last Chance, Hiawatha, Montezuma, and Savage were consolidated in September, 1872, under the name of "The Winsor-Utah Silver Mines," and are now controlled by capital from New York, Michigan, and Utah. The property has since then been worked with energy, and 500 tons of ore, sold for \$60 per ton, have been extracted. The shafts on the different lodes have the following depths: Montezuma, 375 feet; Last Chance, 366 feet; Savage and Hiawatha, 350 feet. Length of tunnels on the property, 550 feet. The outlets of the various mines are connected with the main tram-way, on which the ore is lowered to the valley below, by branch-tracks. All these ore-bodies are comparatively thin, the Montezuma, 3 feet thick, being the largest.

The Wellington mine lies on the mountain-side, opposite the Emma. It is opened by an incline 200 feet deep, and by levels from it about 800 feet long in the aggregate. The deposit is about 30 feet wide, has an ore-layer of about 4 feet in thickness on both walls, and a horse of the country-rock between. The ore-streaks are rather pockety, but the mine has yielded something over the expenses. There is now an ore-body uncovered at a depth of about 100 feet from the surface, in which 600 tons of ore are in sight.

The Davenport and a mine near it, the Matilda, have been sold to an English company, and smelting-works are in the course of construction near the mouth of the cañon, not far from the Flagstaff works. Both mines contain large bodies of rich ore. From the Vallejo the first wire-rope tram-way in the Territory has been built to the foot of Emma Hill, and, according to late accounts, it is a perfect success.

In Big Cottonwood district the Reed and Benson mine has furnished considerable ore, and several other mines have been worked with tolerable success.

In *American Fork district* the operations of the Miller Mining and Smelting Company have been carried out on a large scale. The Pittsburgh mine has also been worked to a limited degree.

The Miller mine is situated three and a quarter miles by wagon road, and two miles by the tram-way, from the Sultana smelting works, which belong to the Miller Company, and are located in the upper part of American Fork Cañon, about twelve miles from its mouth. The mine is not over two and one-half miles distant in an air-line from the Emma mine in Little Cottonwood Cañon. It was discovered in September, 1870, but was not worked on a large scale until the summer of 1871. Up to the middle of August, 1872, about 3,500 tons had been taken from the mine.

The deposit lies in limestone, near the contact with quartzite, and seems to follow the strike of the country-rock. It is, however, extremely irregular, and the mining-work done so far is not calculated to enlighten the visitor much in regard to the shape of the ore-body. The shafts and tunnels are situated about 1,500 feet above the bottom of the steep gorge, which sends its water down towards the East American Fork, on which the smelting-works have been built. There are several short tunnels driven to the deposit, but the upper works are all caved in, and at the time of my visit the ore was principally brought to grass by means of a tunnel, 20 feet lower than the old work. Another tunnel, about 80 feet lower, was in the course of construction, but this has, according to the latest accounts, not met the continuation in depth of the upper ore-mass, though, if the dip had been approximately regular, the ore ought to have been found at 460 to 500 feet from the surface. The

ore-body is in some places quite thick, but in no case over 15 feet; and frequently it is much split up, and short arms branch from it, which do not again join the main channel, but are lost in the country-rock. The ore is a remarkably fine smelting material, being very ferruginous carbonate of lead, which contains much galena. Through the whole mass, and especially around the blocks and lumps of galena, there is found a multitude of small crystals of wulfenite, (molybdate of lead.) Crystals of carbonate of lead are also very frequent. Oxydized copper-ores are occasionally met with. The limestone immediately around the outside of the ore-mass is always very much broken, and similar to that found near the Emma, the large deposits on Ruby Hill, Eureka, and other lead deposits in limestone throughout the West. Near the surface in the upper works the ore assayed \$30 to \$40 per ton in gold and silver, and from 50 to 60 per cent. of lead. During the summer of 1872 the ore taken from the lower works contained, on an average, 56 per cent. of lead, 0.6 ounces of gold, and 40 ounces of silver per ton. The massive carbonate contains 76 per cent., the earthy ferruginous carbonates 25 per cent., and the galena from 63 to 80 per cent. of lead. Toward the end of the year it was reported that the body which had until then furnished the ore was entirely worked out.

The Sultana smelting-works and their operations are described in another part of this report under "Metallurgy." They were started on November 19, 1871, and run until February 5, 1872. The works were stopped until May 27, and from that time on until the time of my visit, in August, one furnace at least, and sometimes two, were kept running. Up to that time 750 tons of lead had been produced, containing about 90 ounces of silver and 1 ounce of gold per ton. These works use probably the cheapest charcoal of any lead-works in the western mining-districts, the total cost per bushel, delivered at the works, being only 13 cents. The coal is burned in kilns, twelve of which were standing on the bank of the creek, opposite the smelter-building, in August, while three more were soon to be built. These kilns are made of rock and brick. They have the shape of an old-fashioned bee-hive, a diameter of 23 feet at the base, and a height of 20 feet. There is a charge-door near the top in the back-side, and a discharging-door in front, level with the ground. A kiln holds 25 cords of wood, and the time of burning is twelve days; 38 to 48 bushels of good solid charcoal are produced per cord of wood, or from 950 to 1,200 bushels per day. Brands are returned into a subsequent fire. The above yield, it is seen, is far higher than can be attained in the common charcoal-pit.

The water-ditch supplying the wants of the smelting-works is 60 feet above the level of the slag-dump, and there is hose-connection to all parts of the building. The total product of the Miller mine and the smelting-works during 1872, was, according to the superintendent, Mr. E. Wilkes, 1,536 tons of lead, the average assay-value of which in gold and silver was \$110.

Besides the Miller, the Pittsburgh mine was the only one being worked at the time of my visit to the district, and, so far as I am informed, no effective work has been done on any others during the rest of the year.

The Pittsburgh is situated one mile northeast of the Miller. It is owned by Pittsburgh parties. In August there was a shaft on the deposit 60 feet deep, from which about 300 tons of ore had been taken. The ore-body lies in limestone on the hanging-wall, and quartzite on the foot-wall, and is exposed by stripping the surface-soil 5 feet wide, and for a length of 40 feet. It stands very nearly perpendicular. The greater part of the ore is very ferruginous carbonate of lead, galena occurring,

however, in nests. The average of the ore shows 55 per cent. of lead, but is poor in silver, assaying only \$13 per ton. These figures are obtained from small lots of ore, which have been smelted at the Sultana Works. There is no sorting whatever necessary, the entire crevice being filled with ore of the above grade, which is so soft that it can all be shoveled out.

A tunnel was being driven at right angles to the course of the deposit, which was intended to strike the latter about 160 feet below the mouth of the shaft, and which, it was thought would be from 160 to 175 feet long. The ore sold to the Miller Company has brought \$18 per ton, delivered at the smelting-works. It is thought that the mine can furnish 30 tons per day as soon as the tunnel is completed.

The Miller Company has, during the last summer constructed a narrow-gauge railroad from the Utah Southern road to a point in American Fork Cañon, sixteen miles distant. Another four miles will bring the end of the road to the Sultana Works. This road is remarkable as possessing the shortest curves and the steepest grades in the country, some of the latter being very nearly 300 feet to the mile.

Parley's Park district is situated in the Wasatch Range, north of Big Cottonwood, and about thirty-three miles from Salt Lake City. The district is comparatively new, having been formed in 1871. During that year the Flagstaff, Piñon, Walker and Webster, Wild Bill, Rocky Bar, and others were discovered. These are lead-mines in limestone, and contain principally carbonates.

The district has since been subdivided, or rather two more districts have been formed in the original one. They are Uintah and Blue Ledge districts. Of the mines in the former one, the Pioneer, Idaho, Gregory, and Porcupine have attracted most attention; of those in the latter, the discovery claim of the McHenry ledge has caused considerable excitement in 1872. I happened to arrive in Salt Lake City shortly after the discovery had been made, and visited Parley's Park. My impressions received at the time are expressed in the following:

The route to Parley's Park from Salt Lake City follows for a considerable way the old overland stage-road, passing Camp Douglas in the distance, and winding through the picturesque Parley's Cañon. The park itself is a small, nearly level plain, surrounded on all sides by the mountains, and the principal mines are near its southern end; on the west, near the summits in which head the famous Cottonwood Cañons over the range, are the Flagstaff, (not the Cottonwood Flagstaff, but an emulous namesake,) Walker and Webster, and Piñon, all in limestone. More nearly south of the park, on a mountain, which, being much covered with boulders, soil, and pine timber, has heretofore been avoided by prospectors, is the McHenry, with its extension each way, and beyond these, on the northeast, the Boulder, and on the southwest, a second extension, the Clara, the Wasatch, and the Red White and Blue, all of which are vehemently declared to be daughters in true lineal connection of the same mother-lode, to wit, the McHenry aforesaid. From the McHenry mine to Salt Lake it is twenty-nine miles; and the road near the mine is very steep and difficult. But to Echo City, on the Union Pacific Railroad, it is only twenty-four miles via the Provo Valley, and a new narrow-gauge railroad, said to be constructing from Echo to Heber City by the Mormons, would pass the foot of the mountain about three miles from the mine.

The mountain is quartzite and granite, mostly hidden from sight by the superincumbent earth and vegetation. Boulders are plenty, and in the small steep cañon on the west they have been carried down for a

considerable distance. It was in this cañon that the rich float-rock was found which led, after much laborious prospecting, to the discovery of the ledge. Not that it was so very hard to see. The discoverer sat on it a dozen times to wonder where it was, never suspecting that the large rock-mass beneath him was the outcrop of a vein.

This outcrop consists of a cliff, about 90 feet high, 250 feet long, and perhaps 15 feet wide on the top, from the edge to the line where it disappears under soil, roots, and boulders. This cliff is believed to be, with the exception of a sheathing of quartzite, which adheres in places to the face, entirely composed of silver-bearing quartz. The evidence consists of numerous assays of samples chipped from all accessible points. The average of sixty-five assays is said to have been a little over \$200 per ton, the minimum being \$22. Some assays have yielded less; but these are declared to have been made upon samples of the quartzite outside of the vein. Perhaps fifty tons have been blasted from one corner of the mass, and form the beginning of a dump. So far as the excavation has gone, it shows the mass of quartz to be more or less charged with "mineral" in bluish and black spots, and ochreous or light yellow stains, as well as copper stains. It looks like a fair milling-ore, and an experiment tried with 75 pounds in San Francisco is said to have proved it to yield its silver readily by raw amalgamation.

It is impossible to say at present with positive certainty what is the form of the deposit. At first it was naturally believed to be an immense boulder; but the discovery of more or less ore in the located extensions gives grounds for believing that it is really an outcrop in place; and the question then arises as to the true dip and real width of the deposit. Its course is northeast and southwest. If it dips southeast, that is, into the mountain, then the 90 feet of vertical exposure represents an oblique section across a vein of say 65 feet thickness. If it dips steeply northwest, that is, with the hillside, then the cliff is a portion of a vein, say 12 feet thick, and stripped on the hanging-wall. In the former case, the assays taken all over the surface might be presumed to represent the character of the vein throughout its whole sectional area. In the latter case the larger number of the assays would represent the character of a zone along the hanging-wall. There are both arguments and indications in favor of the supposition that the ledge is intercalated between layers of quartzite and dips into the mountain. A tunnel, now constructing, about 150 feet below the topmost outcrop, will probably decide the questions of form, thickness, and value. It has already, at 90 feet from the tunnel-mouth, struck hard bluish quartzite, dipping southeast about 30° , and it is expected within the next 90 feet to cut the vein.

The McHenry is owned by Messrs. Whitaker & Templeton. It is popularly reported that a large sum of money was paid for the property; but nobody really knows the terms of the purchase except the parties immediately concerned. At present they are engaged in developing the nature and value of the mine. If it sustains the high anticipations inspired by its superficial appearance, they will probably erect a stamp-mill of large capacity, and commence active operations.

Up to the date of writing this report I have not had any information in regard to the developments made by the tunnel.

From the lead-mines of the district, notably from the Piñon and Flagstaff, considerable ore has been shipped to the smelting-works at Ogden and others. The ore is a kindly smelting material.

West Mountain mining district, in Bingham Cañon, the only district

in Utah, I believe, where placer-gold is found, is reported to have yielded about \$100,000 of gold during the year.

Of lead mining and smelting operations those of the Winnamuck and Utah Silver Mining and Smelting Companies have been the most prominent before the public; the former on account of the success attending them, the latter on account of the utter and disastrous failure of the English Company, which, as I mentioned in my last report, was induced to enter into this enterprise in a rather remarkable manner.

The Winnamuck mine and smelting-works have been managed during the greater part of the year by Messrs. Bristol & Dagget, in the interest of a Rhode Island Company. Late in the year the whole establishment was transferred to an English company, for a consideration of \$400,000. I visited the mine and smelting-works in August. The establishment is compactly built and arranged, mine, furnaces, and office being within hailing-distance, and the ore being lowered directly to the furnaces by an inclined tramway from the mouth of the windlass-drift in the side of the mountain. The mine comprises 2,000 feet on a vein running N. 76° W., and dipping northerly into the mountain. The course of the outcrop on the mountain side is nearly northwest. The general dip of both vein and country is about 45°. The hanging-wall is usually a belt of soft bluish rock (siliceous clay-slate?) but sometimes quartzite; the foot-wall, like the general country-rock, is quartzite. The ore is distributed in chimneys or bodies in the vein, and consists of carbonate of lead and galena, with subordinate associated minerals and siliceous gangue, carrying about 38 per cent. of lead and 56 ounces of silver per ton, as shown by the furnace-assays of nearly 1,300 tons.

The underground works consist chiefly of the discovery-shaft, 65 feet deep, a drift from it 30 feet long, an incline from this drift 130 feet deep, and a shaft 75 feet deep from the bottom of this incline. The windlass-drift above mentioned, through which the mine is worked at present, enters the face of the mountain on a level with the drift above mentioned. About 150 feet vertically or 200 feet inclined below the windlass-drift, a tunnel has been run in 600 feet on the contact-plane between the blue hanging-wall rock and the quartzite. This tunnel is not a part of the producing-mine at present. It is carried on to prospect the character of the vein in depth. Thus far it has developed no carbonate ore like that above, but a vein of mixed galena and iron pyrites is shown in it, which will be followed upward by winzes. The discovery indicates the continuance of the contact-vein in some form at greater depths than those now worked.

The average thickness of the vein is something over 4 feet—maximum, 20. Two bodies of ore have furnished the amount hitherto extracted. The first was about 100 feet long by 250 feet in depth on the vein. The second, a small, rich body, was about 20 feet long by 60 feet deep and 2½ feet thick. Out of these bodies there have been extracted and reduced, from August 1, 1871, to June 30, 1872, about 2,200 tons of ore, yielding a net profit of \$80,000. The mine cost is very small, as the vein-matter is thoroughly decomposed and can be removed without blasting, while at the same time the stopes and drifts do not require expensive timbering. The reserves of good ore still standing in the mine are considerable in amount.

Smelting in this locality is, of course, expensive. Charcoal costs (freight and waste included) something over 30 cents per bushel; iron-ore, (the pure red hematite brought from Rawlins, Wyoming Territory,) \$22.50 to \$25 per ton; limestone, \$7 per ton. Fire bricks are brought from Golden City, Colorado, or even from Illinois. As the charge of the fur-

naces consists of about 13 parts ore, 4 parts iron ore, 5 parts limestone, and 6 parts charcoal, with two parts old slags, it will be seen that the *Beschickung* is highly expensive. In respect of completeness of extraction, the works are doing excellently for this region, the total losses in treatment being 6.4 per cent. of the lead and 5.8 per cent. of the silver contained, as per fire assay, in the ore.

The works comprise two Piltz furnaces, 14 feet in height from the tuyeres to the feed-hole, $3\frac{1}{2}$ feet in diameter at the tuyeres, and 18 inches in thickness of walls. There are six tuyeres, with $2\frac{1}{2}$ inch nozzles. The slag-discharge is 10 inches below the tuyeres—a point strangely overlooked in most of the Utah furnaces, where the blast is usually directed almost upon the lead. The automatic siphon-tap is employed. Blast is furnished from the Root blowers. They have been worked up to a pressure of 2 inches of mercury; but the usual pressure is $1\frac{1}{2}$ inches.

The principal trouble in running the furnaces is the shortness of the campaigns, which are terminated either by the formation of "salamanders," or by the burning out of the walls. The latter is the most serious evil, and it is rendered more frequent by the employment of so much iron-ore, and the formation of a basic slag (probably a singulo-silicate at least) which attacks the fire-brick. It is said that the bricks made in 1872 at Golden City are unusually liable to be slagged away. This may be the case, but I fancy the constitution of the slags, and the high temperature and pressure sometimes employed to prevent or remove salamanders, are sufficient causes for the rapid consumption of the walls. Two weeks appear to be frequently the limit of a campaign.

The extra expense incurred by this method of running is partially balanced, at least, by the increased quantity smelted per diem. One furnace will reduce about 14 tons of ore daily, producing about 5 tons of bullion, worth in silver about \$153 per ton.

A more detailed account of the operations of these furnaces will be found in the metallurgical part of the present report.

According to the superintendent, Mr. Ellsworth Dagget, there were smelted, during the year 1872, at the Winnamuck Works, dry ore, $3,954\frac{913}{1000}$ tons, containing $1,383\frac{712}{1000}$ tons of lead and $203,536\frac{58}{100}$ ounces of silver, and producing $1,232\frac{741}{1000}$ tons of lead and $191,661\frac{4}{10}$ ounces of silver; total value of silver and lead produced, \$353,551.26, assaying per ton, 34.98 per cent. of lead and 51.46 ounces of silver, and producing 31.16 per cent. of lead and 48.46 ounces of silver; losses in units, 3.82 per cent. of lead and 3.00 ounces of silver; losses on total contents, 11 per cent. of lead and 5.83 ounces of silver.

By total value in the above is meant the actual amount received for the products.

All of the ore handled, excepting a few tons, was from the Winnamuck mine.

The Utah Silver Mining and Smelting Company has during the year expended the total amount of money (\$100,000) raised at the end of the previous year in addition to the original working-capital. Besides this, a debt of \$35,000 was incurred. The condition of the enterprise at the end of the year will appear from the following abstract of a lengthy report to the directors, by Mr. J. R. Murphy, the superintendent:

Fully appreciating your disappointment in my not being able to bring the property to a paying condition as early as you have been from time to time led to expect, nor yet to do so with the amount of funds at first considered sufficient, I have entered more at length into an explanation of the difficulties which had to be surmounted, as well in the prospecting and opening of the mines as in the dressing and smelting of the ores, before the property could possibly be brought to a remunerative basis, that you might the more clearly comprehend the situation, and therefrom be able to estimate properly

the magnitude of what the developments of the past season have proven the property to be possessed.

I have placed before you the work done on the mines in a detailed form, with the cost, from which you may judge its character, and the prospects exposed thereby in the different portions of the mines as explored. I also present to you a plan for the management of the property, treatment of the ores, &c., which is but a repetition of what I have already set forth in the course of the past spring and summer, as the only system under which it can be made to pay, but which, unfortunately, the means at command would not allow of being carried out to the present. To the latter I would most particularly beg to call your attention." * * * "The cost of each ton of ore smelted is: in fluxes, \$6.96; charcoal, \$15.80; labor, \$4.27; calcination, \$5.30; mining and incidentals, \$6.00; aggregating \$38.33 per ton. While the amount produced from each ton of ore smelted was, gross, \$43.85, leaving only \$5.52 as net profit on each ton of ore. The causes which led to so unfavorable a result, as already explained, arose in having to smelt, in the absence of dressing-machinery, so much barren stuff of the most refractory kind, and in having to haul from railroad up a mountain-road all the material required, a distance of twenty miles, at \$10 per ton; the waste on charcoal alone being fully 12 per cent, owing to its soft and friable character, the re-loading and hauling over a rough road breaking it to fine powder. * * *

Total received from London, £19,300, equal	\$101,913 20
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Total received from bullion-product, net	8,311 00
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Credit used, against which there is available stock on hand of \$7,000, and stock in store to amount of \$14,640	35,000 00
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* * * This indebtedness was incurred since September last, believing that the capital would be forthcoming to remove smelting-furnaces and put up concentrators; stocks of fuel-wood, mining-timber, coal, iron, and other necessities were laid in, in the expectation of being able to mine and smelt through the winter months, as might have been done had the means been furnished in September or October.

Much of this indebtedness was incurred in pressing forward developments on the mines before the approach of winter.

In addition to the foregoing encouraging prospects for the future of the Utah Company, there are some few others to be noticed. One is, that more cubed galena is found as greater depth is attained, and that, wherever found, it invariably carries from \$5 to \$40 per ton more silver than the short-grained galena, which predominates in the upper portions. Another great advantage is in the construction of the Bingham Cañon Railroad to within two and a half miles of the company's mine, and passing through the new furnace-site secured by me to the company in March last, in anticipation of my full plan being carried out to move furnaces, &c., to where the company have ten acres of a most eligible site, with water-right for water-power intended to be used in place of steam in driving air-fans, rock-breakers, and other machinery, as may be required. One great advantage to be gained in smelting at the railroad is the close proximity to the mines of the two Cottonwood districts, from whence ores can be obtained which would serve as a flux to the Utah Company's ores, owing to the presence of an unusual percentage of oxide of iron, which would obviate the necessity of using barren iron to any per cent. whatever. The distance from your mines to your new furnace-site is, from mines to railroad at Bingham Town, two and a half miles by teams; from Bingham Town to site by railroad fifteen and a half miles, where the proposed works will be in direct communication by railroad with the outside world for export or import, with an unlimited supply of water, and a climate in which nearly all kinds of out-door work can be carried on throughout the whole year.

I would beg again to remind you of the importance of developing the Belshazzar mine, which I am certain will prove equally, if not more, valuable than the Red Warrior has proved. Get your ore-dressing machinery to work as soon as possible, when you can ship the dressed ore to Liverpool for sale while the smelting-works are being built, keeping the mines running through the winter, raising ore, and I guarantee that within six months from this day the Utah will be paying satisfactory dividends.

The "guarantee" offered in the concluding paragraph of this extract is an extraordinary illustration of sanguine expectations based upon uniformly discouraging results. It is a pity that the resolution and perseverance displayed by the English stockholders of this company had not been applied to a more promising enterprise.

A large number of other mines have been worked more or less in this district during the year, but important results have been obtained so far from none of them.

In the main Bingham Cañon the West Jordan, Kenosh, Galena, Orphan Boy, Consolidation, Vespasian, Sultana, Elizabeth, Northern Light, and the mines of the two companies noticed at length heretofore, are situated;

also the Kelsey tunnel, which is intended to strike ten ore zones or deposits lying in front of it on the mountain-side. It is now over 350 feet long, and has passed two of the ore-deposits, said to be respectively 6 and 9 feet thick. On Silver Hill the Spanish, Queen, and Buckeye mines are located. They are reported to have been lately sold to New York capitalists.

On the hill dividing the main Bingham Cañon and Butterfield Cañon lie the Eagle Bird, Yosemite, and Telegraph; in Butterfield Cañon the Osceola, Lucky Boy, Bemis, and Hyatt; in Spring Gulch the Greeley, Royal, and Legal Tender; in Carr Fork the Nabob, White Pine, and Clipper; in Muddy Fork the Saturn, Last Chance, and Cræsus; in Markham Fork the Washington, Oro, &c.

The Saturn ore was, in the earlier part of the year, shipped to the Saturn smelting-works, on the Utah Southern Railroad, but it was of too low a grade to be profitably worked, and when I visited those works in August they were smelting ores from other sources.

The Last Chance has been sold to an English company, which has a nominal capital of \$100,000. According to notes from Mr. N. M. Maxwell the mine was 300 feet deep at the end of the year, and over 1,000 feet of levels had been driven. The lode was on an average 4 feet wide, and is situated in granite containing porphyritic dikes (?). The pay-streak of the lode is 18 inches wide, and its value is \$80 in silver and \$15 in gold per ton. There is only 8 per cent. of lead in the ore. The mine is capable of producing 30 tons of ore per day, and the ends of the various levels, as well as the bottom of the shaft, are in good ore.

According to the account of a meeting of the directors, held on February 3, 1873, and published in the London Mining World of February 8, it was proposed to buy a lead-mine in addition to the Last Chance, for the purpose of using the lead-ores for the extraction of the precious metals in the Last Chance ore by means of smelting. There were also three furnaces to be erected. Locality not given.

From Rush Valley and Ophir districts I have not had any detailed reports this year. No news of important developments, with the exception of those at the Mono lode, have, however, appeared in public, and it is fair to presume that none have been made. Both districts were described at length in my last report. The Mono is situated on the Snow-Storm Hills, in Dry Cañon. The ore is very rich in gold. The smelting-works erected during the summer by Mr. Jacobs in Stockton, to work ores from Dry Cañon and do a custom business, appear to have stopped operations.

In Camp Floyd district the English company, which acquired during the early spring the Sparrow-Hawk, Last Chance, and Marion, has worked its mines actively, employing from forty to fifty miners. The same company have built a mill containing 20 stamps, and capable of reducing 30 tons of ore per day. A tram-way connects the mill with the mines. According to late accounts the company has not been financially successful. An abstract of an article furnished by Colonel Foriseth, of Salt Lake City, to the Mining and Scientific Press, of San Francisco, describes the developments of other mines in the district as follows:

The Mormon Chief and its extensions, the Grecian Bend and London, consist of 3,000 linear feet. The developments in tunnels, cuts, shafts, drifts, and inclines, will measure about 500 feet, showing a large body of free milling-ore. The Camp Douglas Consolidated has a shaft of 47 feet in depth, besides two open cuts, and the indication so far is not sur-

passed by any mine in the district equally developed. The Silver Cloud has a shaft 55 feet deep, and a level driven 180 feet from the bottom of the shaft on the course of the vein, showing 12 feet in width of rich ore. A tunnel has also been run 275 feet to cut the vein below. A mill-site has been located adjoining the mine, upon which is a fine spring of water. The Star of the West, owned and worked by a New York company, is developed by several open cuts and shafts. The Stafford mine has a well-defined vein of ore, and is being actively worked by open cuts and a tunnel now 60 feet long. The Carrie Steele adjoins this mine, and is promising well. The Silver Circle, Wandering Boy, Legal Tender, Comstock, Silver Star, America, Excelsior, and Lone Star, are all considerably developed and promise well. The General Morrow has a shaft 55 feet deep, and is very promising. The Antelope has now a shaft 7 by 7 and 12 feet deep; also an open cut 6 feet wide and 10 feet in. The ore from this mine is of good quality, and assays high. The Queen of the West, now owned by a Detroit party, is being actively worked, and a good quality of ore is produced therefrom. The Elkhorn is also considerably developed by shafts and a tunnel 60 feet. This is a very promising mine, and is in close proximity to the English company's mill, but work has for the present been suspended, owing to a want of means to continue the development.

The following mines have been surveyed for United States patents: Sparrow Hawk, Last Chance, Marion, Consolidated Camp Douglas, Silver Star, Wandering Boy, Silver Circle, Star of the West, Silver Cloud and mill-site, Red Eagle, Black Warrior, Gentile Belle, and American Flag consolidated mines.

A second stamp-mill has recently been completed at Fairfield by Messrs. Baxter & Hussey, which will be in running order in a short time, and is especially designed for custom-work.

East Tintic district.—For the information in regard to this district I am principally indebted to Mr. W. P. Ward, M. E., of Salt Lake City.

The principal mining-camps of this district, Eureka, Silver City, and Diamond City, are situated within seven miles of each other, and lie about ninety miles south of Salt Lake City. The most southern of these camps is Diamond City, three and one-half miles southeast of Silver City, and situated in a small gulch, opening into the Great Tintic Valley. The most important claims are located in a hill north of the town. Among them I may mention the Joe Bowers lode, running N. 70° 30' W., and dipping 1 foot in 2½ feet, equal to about 25 degrees, west. Going over the hill to the north one first sees some small prospecting holes, showing but little ore, though all the ledge-rock is deeply stained with oxide of iron. Mr. James M. Wayne, the engineer in charge of the operations of the Wendigo Mining Company, of Marquette, Michigan, informed me that the croppings all along this portion of the lode assay about \$15 per ton in silver. Over the brow of the first little hill small quantities of black sulphide of silver have been found, which run over \$600 per ton. This prospect belongs to the Wendigo Company, whose principal shaft, 100 feet deep, lies higher up on the hill.

At the main shaft the ledge is 20 feet wide, and carries but little ore. A white, partially decomposed mineral, containing a considerable quantity of silicate of alumina, impregnated with small crystals of iron-pyrites, accompanies the vein. The Wendigo Company owns 1,300 feet on the lode south of the discovery-shaft. Two-thirds of the discovery-claim belong to Mr. Tostavin. In this claim there is a shaft sunk 55 feet deep, and showing in the bottom a seam of ore 8 inches wide, and a quartz-vein 4 feet wide, highly colored, and impregnated with decom-

posed pyrites. The ore on the dump at this shaft is said to average \$70 per ton in silver.

East of the Bowers ledge and running diagonally to it, in a northwest direction, is the Shower ledge, 2,400 feet, under the control of the Tintic Mining and Smelting Company. At the principal shaft the ore streak is from 1 to 3 feet in width, and sometimes widens out to 5 feet. The ore consists of carbonate of lead, colored with hydrated oxide of iron, and containing some galena. This ore is said to average about 50 per cent. of lead and \$80 in silver per ton. The same company own two furnaces, one of them very poorly constructed, and the other of a very singular pattern, known as Richards's patent. The bottom of this furnace is about $2\frac{1}{2}$ feet above the floor of the works, and is constructed of iron, and hung on hinges, so that it can be opened, and allow the salamanders, which may have formed in the furnace, to drop out.

Three miles south of Diamond City are a number of prospects containing galena. The Alice has a shaft 100 feet deep, and shows a vein $2\frac{1}{2}$ feet broad, running north and south. The galena averages about \$50 in silver per ton. This belongs to the Wendigo Company.

The Rising Sun Tunnel Company has a tunnel about one-half mile south of Diamond, running under a number of galena-claims. The owners of the claims are friendly to the tunnel, and have deeded portions of their claims to the company when their ledges are reached. Monterey, Elephant, King Philip, Saratoga, and Jefferson are some of the claims which the tunnel is intended to cut.

The Morning Glory claim is situated on a parallel ledge to the Joe Bowers, and lies to the west of it. About 50 tons of copper-ore, averaging, from appearances, about 10 per cent. of copper, were upon the dump at the time of Mr. Ward's visit. The copper is in the form of blue and green carbonates. The claim includes 3,000 feet on the lode, and has lately been bonded for \$25 per foot.

The Swansea is a mine located about a mile north of Silver City, and is being successfully worked under the management of Mr. Meade, of Salt Lake City. The ore runs well in both lead and silver, and works well in the furnace. Considerable quantities of ore have been shipped from this mine during the summer and fall of 1872.

By far the richest and most promising mines in the Tintic district are the Mammoth Copperopolis and the Crismon mines. They are situated close together on the range between Diamond and Silver Cities. In August, 1872, there were three large openings upon the property of the Mammoth Company, from each of which ore was being sacked up and shipped in large quantities to Liverpool.

At the time of Mr. Ward's visit a tunnel was being driven to cut the lode at a depth of 200 feet. There were still 150 feet to run to cut the lode. In an open cut in the hill south of that in which the first openings were made a vein of gold quartz lying by the side of a 12-foot vein of massive copper-ore had been opened. The quartz formed in fact the foot-wall of the copper ledge. The gold rock must run into the thousands per ton, for the yellow metal could be plainly seen in almost every piece broken from the vein. The copper-ore lying adjacent carried little or no gold, but the gold is reported to run over into the copper-ore farther in the hill. The deepest shaft on the property was 60 feet. The ores are blue and green carbonates, black oxide, red oxide of copper, and occasionally small quantities of copper-pyrites are found. The first-class ore from this mine runs 35 per cent. of copper, and about 50 ounces silver per ton. Second-class 22 per cent. of copper, and 20 ounces silver per ton.

North of the Mammoth, and separated from it by a gulch, lies the Crismon mine. The character of the ore is the same as in the Mammoth, but it runs much higher in silver, averaging about 150 ounces per ton.

The mines of the Mammoth Copperopolis Company of Utah (limited) have yielded during 1872 about 2,000 tons of copper-ore, 1,000 tons of which, valued at \$150 per ton, were shipped to Swansea. The other 1,000 tons, said to contain 11 ounces in silver and \$50 in gold per ton, were extracted from the south hill, and are on the dumps awaiting the erection of a mill.

At the end of the year the section of the mine lying on the south hill was opened by an open cut 50 feet long, 30 feet wide, and 30 feet deep. A shaft 50 feet deep was sunk from the bottom of the cut, and thence a drift was driven in a southerly direction, on the course of the vein 50 feet in length, also a drift north 45 feet in length. These developments had exposed to view a vein 20 feet in width, from which can be extracted 100 tons of ore per day. The tunnel was still being driven from the foot of the hill, and was in about 60 feet.

The north hill, which has yielded the greater portion of copper-ore, was developed by three shafts, the depths of which were respectively 71, 55, and 45 feet, besides drifting to the extent of 260 feet. In addition to the above there were several chambers below and above the levels, which had been excavated by stoping out the copper. The main tunnel was being driven from the foot of the hill, and was then in 275 feet. It will cut the vein 100 feet below the present workings. About eight tons of copper-ore were being extracted daily from this section of the mine. A force of forty-five men was employed on the works. The company had purchased a fine mill-site, and intended to erect on it a 30-stamp mill and furnace.

Eureka Hill.—The Eureka Mining Company of Utah now hold full possession of all the mines situated on this hill. There are four parallel ledges known as the Eureka, Deseret, Young Lion, and Montana, on each of which the Eureka Company owns 2,200 feet. The locations were made in 1870, since which time a large amount of work has been done upon them, and a survey for a United States patent made. At the time of Mr. Ward's visit the company were sinking a very large shaft and timbering it splendidly. This shaft is intended to cut all the veins at a considerable depth and to serve as a main working-shaft. The Eureka Company have been much troubled by jumpers on their claims, but they have the prior location; and, by the expenditure of a great deal of money, have traced out all jumpers and proved the continuity of their veins.

At the time above mentioned no ore was being raised, as the company had a large amount above ground, (enough, it was said, to keep a 20-stamp mill in operation for a year,) and their mill was not yet complete.

Since that time the Eureka Mill at Homansville has been completed and put in operation, and also the Wyoming Mill, at the same place.

The Eureka Mill, at Homansville, belonging to the Eureka Silver-Mining Company, of Utah, is located in Tintic district. This is a mill of the California pattern, but the machinery was all built at the Council Bluffs Iron-Works, Iowa, and the complete mill was erected by their agents, Messrs. Hendrie Brothers, of Salt Lake City. There are twelve revolving stamps, which have an improvement, not before introduced on the Pacific coast, of a cast-iron guide for each stem, on the same principle as the stuffing-box to a cylinder, which keeps the stem perpendicular, prevents the wear of the guides, and needs no renewal. They are

claimed as a decided improvement on the usual wooden guides. There are also six 5-foot Varney pans, three 7-foot settlers, two agitators, all with iron rims, and one 9 by 15 large Blake crusher. These are all run by a highly finished engine of 18 by 30 cylinder, having two boilers 52 inches in diameter, and 16 feet long, with iron fire-front. This does not support the boilers, which rest upon the brick furnace erected upon a new plan, and claimed to economize fuel to a great extent.

The water to supply the mill is forced up from a pond 70 feet vertically below, and 300 feet distant from the tank, by one of the steam-pumps manufactured by the Council Bluffs Iron-Works. It supplies the mill abundantly.

The mill is adapted to wet crushing, and has a capacity of 25 to 35 tons per day, according to the nature of the ore worked. There is more machinery in this than in the Wyoming Mill, but it works smoothly, and does credit to the builders. The cost of the mill was \$45,000.

The Wyoming Mill, belonging to the Wyoming Mining Company, of Cincinnati, Ohio, is also located in Tintic district. It contains ten revolving stamps, four 4-foot combination pans, (Wheeler & Varney pattern,) two 7-foot settlers, and one cleaning-up pan. The engine cylinder is 14 by 32 inches, the boiler (tubular) 50 inches in diameter and 14 feet long. The speed of stamps is 82 drops; of pans, 60 revolutions; and of settlers, 11 revolutions per minute. There is an 8 by 15 Blake crusher.

This is a dry-crushing mill; capacity, 10 tons per day. There is also attached to the mill a Stetefeldt furnace, with a capacity of 30 tons per day. The machinery was made at the Marysville foundery, California, and the mill was erected under the superintendence of D. J. Bell, of California. This is a good mill, and has cost \$85,000 including the approaches to the mill, &c.

There are a number of other districts south of those already mentioned, such as *Ohio* or *Sevier*, *Lincoln*, *Star*, and *Beaver Lake*, none of which has so far contributed greatly to the product of the Territory. Granite district, sixty miles west of Ophir district, and Mineral Point district, sixteen miles from Bingham City, are also new districts. The latter is reported to contain very valuable deposits of iron-ore.

In Lucien district the Tecoma mine and several other claims are reported to have lately been sold to an English company.

List of smelting-furnaces and amalgamation-works in Utah.

Name.	No. of smelt- ing-furnaces.	No. of roast- ing-furnaces.	No. of stamps.
Warm Springs Smelting-Works, Salt Lake City.....	1	1	.....
Badger State Works, on State road.....	1	.....	.....
Wahsatch Smelting-Works, on Utah Southern Railroad.....	2	1	.....
Robbins's Smelting-Works, on State road.....	1	1	.....
Saturn Smelting-Works, Sandy Station.....	3	.....	.....
Flagstaff Smelting-Works, mouth of Little Cottonwood.....	3	.....	.....
Davenport Smelting-Works, (in course of construction).....	.....	.....	.....
Wellington Smelting-Works, in Little Cottonwood.....	1	.....	.....
Monitor Smelting-Works, mouth of Little Cottonwood.....	1	.....	.....
Utah Company's Smelting-Works, Bingham Cañon.....	2	2	.....
Winamuck Smelting-Works, Bingham Cañon.....	2	.....	.....
Sultana Smelting-Works, American Fork.....	3	1	.....
Utah Smelting and Milling Company's Works, Homansville.....	2	.....	.....
Tintic Smelting Company's Works, Diamond City.....	2	.....	.....
Waterman Smelting-Works, Stockton.....	2	.....	.....
Ophir Upper Smelting-Works, East Cañon.....	2	.....	.....
Ophir Smelting-Works.....	1	.....	.....
Utah Mining and Smelting Company's Works, East Cañon.....	1	.....	.....
H. S. Jacobs & Co.'s Works, Stockton.....	3	.....	.....
Gilbertson & Barry's, Deep Creek.....	1	.....	.....
Register Smelting Company, Ogden.....	1	.....	.....
Alger Reduction-Works.....	1	1	.....
Pioneer Mill, East Cañon.....	.....	.....	15
Eureka Mining Company's mill, Tintic.....	.....	.....	12
Wyoming Mining Company's mill, Tintic.....	.....	.....	10
Camp Floyd Silver Mining Company's mill, Camp Floyd.....	.....	.....	20
Brevoort Mill, East Cañon, (steam-stamp).....	.....	.....	2
Chicago Company's mill, Ohio district, on Sevier River, (steam-battery).....	.....	.....	2
Total.....	36	7	61

Wahsatch Smelting-Works.—In regard to the Wahsatch Smelting-Works, seven miles south of Salt Lake City, which have been erected during the fore part of 1872, I have the following details, furnished by Alfred Wartenweiler, esq., the metallurgist of the establishment:

The works, as first constructed, contained only a Flintshire reverberatory and a small slag-hearth. Since Mr. Wartenweiler took charge, the old English process has been thrown overboard as unsuited to the ores and not economical. A shaft-furnace, which has so far given excellent satisfaction, has been built and put in operation. Its dimensions are about as follows: Section at the tuyeres, 2 feet 6 inches by 3 feet. From here upward the two side-walls start outward, so that at the charge-door the section is 4 feet 2 inches by 3 feet, the front and back walls being perpendicular. Height from the tuyeres to the charge-door, 7 feet 4 inches. There are three wrought-iron water-tuyeres with 2½-inch nozzles. The inside lining is Colorado fire-brick, and campaigns of four weeks' duration have been made. Connected with the furnace is Arent's automatic tap, from which the lead is drawn off into a second pot. This is done because copper-matte finds its way into the basin of the automatic tap—why, does it not appear from Mr. Wartenweiler's letter—and, as this forms a hard coat on top of the lead, the latter cannot be continually ladled from this basin.

The ore, as delivered at the works, is first sifted through a coarse sieve. The part falling through goes to the reverberatory-furnace, where it is simply agglomerated, the object being to prevent losses in the shaft-furnace from fine ore being blown out of the top. The coarser part, remaining on the sieve, goes directly, without a previous roasting, to the shaft-furnace, the greater part of the ore being in an oxidized

form, and the cost of roasting in reverberatories too high. Some sulphur is at any rate required to cause the copper in the ores to go into a matte, which, although it contains always considerable lead, can be roasted sufficiently in open heaps.

Of the ores, which so far have come to the works, those of the—

	Pb, per cent.	Fe ₂ O ₃ , per cent.	Si O ₃ , per cent.
Reed & Benson, Big Cottonwood Cañon, contains	28	22	
Wellington, Little Cottonwood Cañon, contains	27	.....	16
Spanish Hill, Bingham Cañon, contains	48	.....	31
Emma, Little Cottonwood Cañon, contains ...	45	.....	27

Fuller and more exact analyses of the ores Mr. Wartenweiler has not been able yet to make. He has endeavored to mix them so as to obtain, without any other addition than that of old slags, a slag containing 47 per cent. Fe O and 38 per cent. Si O₃. Assays of the same show 3 per cent. of lead and 1 ounce silver in the ton. In making the above mixture Mr. Wartenweiler avoids the addition of the costly iron-ore from Rawlins as flux, and increases the capacity of the furnace considerably. Thus the furnace smelts now in twenty-four hours 20 tons of ore, while of any of the above siliceous ores alone, for instance of the Emma ore, not more than 10 tons can be smelted in twenty-four hours, and the Rawlins iron-ore, costing \$15 per ton, must be added in large quantities. A charge of 300 pounds requires 30 pounds, or 10 per cent., of coke, which is now (end of the year 1872) almost universally used instead of the charcoal used before. Smelting with coke, at \$30 per ton laid down at the works, is about \$4 cheaper per ton of ore smelted than smelting with charcoal at 30 cents per bushel. The cost of slagging the fine ore in the reverberatory is about \$4 for labor and fuel, (the latter being lignite.) Smelting in the shaft-furnace costs \$13 per ton of ore. All the above values are currency. The old slag-hearth was intended to be used for smelting second-class copper-ores from the Mammoth Copperopolis in Tintic. A lot of these at the works assayed 24 per cent. of copper and 11 ounces of silver per ton.

Germania Separating and Refining Works.—These works have been lately built, and are the first of their kind erected near the western mining districts. A description of the same, by Mr. Bentham Fabian, appeared in the Salt Lake Tribune of January 4, 1873, which I reproduce here. The works were only commenced when I visited Utah in the summer of 1872, but were finished soon enough to commence working in December.

The object of these works is to separate from the impure lead-bullion the precious metals which it contains, as well as its impurities; and to effect this on the spot where the bullion is produced, and thus save the expense of shipping worthless matter at great cost to points far distant.

The works are situated on the west side of the Utah Southern Railroad, about eight miles from Salt Lake City. The buildings are extensive, substantial, and arranged with a view to economy of labor and convenience in manipulation. They consist of the main building or furnace-house, refining-house, assay-office, engine-house, and all necessary offices and out-houses, together with manager's and superintendent's dwellings. In the furnace-building are five large cast-iron pots, set in substantial brick-work, each one over its furnace or fire-place, two reverberatory softening-furnaces, two calciners, and two flowing-furnaces. Connected with this building is the engine-house, containing a fine 45-horse-power engine and a 55-horse-power boiler. A little to the north of this is an inclined shaft-furnace, while to the west of the works, at a distance of a few rods, is a substantial brick-stack, which is connected with the furnaces by means of underground flues of strong masonry. A side-track is laid from the main railroad track to the works, by means of which all the materials employed are brought to their respective destinations without transshipment.

The process which is used for separating the lead and silver is that known as Flach's process, with some additions and improvements made by Mr. Sieger, the superintendent of the establishment.

The following description will give some idea of the *modus operandi*:

About 23 or $23\frac{1}{2}$ tons of base bullion, as received from the different smelting-works, are put into one of the largest of the pots, which are five in number, two of them having a capacity of 25 tons each, the other three being smaller; the whole number being set in the form of a wedge, the two largest forming the broad part, while the smallest pot forms the point. A sharp heat is kept up until the impure lead is thoroughly melted, and sufficiently hot to melt the zinc (which is the medium of separation) immediately on its addition, or at a temperature of about 411° Celsius, the melting-point of zinc. Zinc is employed for the separation of gold, silver, and copper from lead, owing to its possessing a greater chemical affinity for these metals than that of lead. The zinc employed at this establishment is of two kinds, viz: commercial or good zinc, and dross zinc, (a refuse matter from galvanic batteries,) which contains about 30 per cent. of iron. The former is obtained from Illinois, at a cost of 9 cents per pound, and the latter from New York, at a cost of 5 cents per pound. When the base bullion is tolerably free from impurities and contains from 150 to 200 ounces of silver per ton, $2\frac{1}{4}$ to $2\frac{3}{4}$ per cent. of zinc, or 3 to $3\frac{1}{2}$ per cent. of dross zinc suffices for its complete desilverization.

As soon as the metal has attained the requisite heat, from $\frac{1}{2}$ to 1 per cent. of zinc, or from $\frac{3}{4}$ to $1\frac{1}{2}$ per cent. of zinc-dross is added to the molten mass, which is well stirred by two men for half an hour, and then allowed to remain still for three hours. Immediately after stirring, the fire is withdrawn from under the pot, and the metal allowed to cool to a dull red heat. The zinc being thoroughly mixed with the lead, takes up the gold and copper, with the greater portion of the silver, and rises to the surface, forming a scum or cake, which gradually covers the whole of the lead.

The object of adding a portion and not the whole of the zinc at one time, is to avoid the caking of the zinc on the surface of the metallic bath, whereby it would not be in a state of division sufficiently fine to mix thoroughly with the lead.

At the expiration of three hours this scum is skimmed off and transferred to the pot next in advance. The whole operation, from the commencement to this point, occupies about four hours, but varies with the amount of the impurities in the lead. A second addition of zinc is now made, in the proportion of $\frac{1}{2}$ to $\frac{3}{4}$ per cent. of zinc, or 1 to $1\frac{1}{2}$ per cent. of zinc-dross.

The dross or scum in the second or advanced pot, after being melted, stirred, and allowed to cool, is skimmed, and the skimmings are transferred to the third or end pot of the series, the alloyed lead and zinc containing a little silver which has separated from the dross being moved back to No. 1. This is effected by means of an iron-gutter leading from the rim of one pot to that of the other, into which the lead is ladled. A similar process is then performed with pot No. 3, the dross being skimmed off and transferred to a receptacle called the "safe," and the separated alloy of lead and zinc carried back. The remainder of the zinc having been added to pot No. 1, it is again stirred and skimmed, the skimmings being put aside for a further operation.

The lead remaining in pot No. 1 is now practically free from gold, silver, and copper, but is rendered a little hard by a portion of the zinc remaining in it, together with a little antimony, of which, if there is much in the base bullion, a small percentage remains.

At the bottom of the large pot is a pipe connected with an iron gutter leading to the hearth of a reverberatory softening-furnace, which is placed at a lower level than that of the pots, to avoid the necessity of moving the lead by hand.

These furnaces, of which there are two, one for each large pot, are 15 feet 6 inches long and 9 feet 4 inches wide, internal dimensions, with a hearth or bed of sufficient depth to contain the contents of the large pot. The bed of this furnace is composed of a large iron pan cast in three pieces, and having the bottom flat and gradually curving to meet the upright sides and ends. This is covered with fire-clay, and above the clay with fire-brick set on end. When well put together these parts will last for years. The furnace has only one fire-grate, placed at the end. These furnaces are built upon arches, which serve to keep the bottom cool, and in order to more easily remove any lead which through bad setting may trickle through. The furnace having been raised to the requisite temperature, the lead-pot is tapped, and the metal allowed to flow into the furnace. The heat is then kept up, and a portion of the zinc and antimony is oxidized and escapes in the form of fume, while the remainder forms a scum which rises to the surface and covers the bath of lead. The lead is well rabbled from time to time with iron rakes, in order to expose a fresh surface to the air, and this is continued until the lead shows, by samples taken from the furnace, that it is pure and ready for tapping.

At a distance of a few feet from the end of the furnace is another pot, called the market-pot, the level of its rim being a little below that of the hearth of the furnace, and into this the lead, after being skimmed, is allowed to flow through an iron gutter.

The molds, which are on wheels, having been run under this pot, the lead is admitted into them by means of a tap.

These bars of lead are made to weigh about 140 pounds each; and, when cool, are taken out and ready for shipment. They are now wheeled up an incline, but it is intended to have a raised tramway over the tapping-place, on to which small wagons containing the bars will be hoisted, and run directly to the side-track. This lead is now pure, containing, on an average, not more than half a hundred-weight of silver to the ton, and being free from gold, copper, and all impurities, and fit for any of the purposes to which lead is applied, either for making white or red lead, sheet, or pipe.

The loss in this furnace is very trifling, not amounting to more than one-half per cent., because the molten lead is almost continually covered with the crust of zinc, &c.

The whole operation, from the loading of the first pot to the tapping of the market-lead, occupies twenty-four hours, and at the present time the capacity of these works is 40 tons per day. So that each twenty-four hours about 90 per cent. of the bullion operated upon is returned as pure marketable lead.

The dross obtained from the last skimming of No. 1 pot is transferred to a flat-bedded calcining or roasting furnace, of which there are two in the main building, one for treating the pot-skimmings, the other for the skimmings from the reverberatory furnace. It is here thoroughly roasted at a temperature insufficient to soften it so as to get rid of any remaining zinc or antimony, and, when sufficiently roasted, it is put in the flowing-furnace, where the lead is separated from the iron and other matters which form a slag which is worthless. The lead is tapped and returned to No. 1 pot, with a fresh charge of bullion, when the same routine is again gone through. The flowing-furnace is very similar to the reverberatory softening-furnace, differing only in the form and material of the furnace-bed. The calciners, before mentioned, have each two grates, with a flue rising from the center of the furnace. The object of the two grates is to obtain a high degree of heat, when necessary for the roasting of refractory or very impure skimmings.

The same process is gone through with the skimmings from the softening-furnace. The next point is the treatment of the rich alloy from pot No. 3, which was placed in the "safe." This is taken to the shaft-furnace before mentioned.

This is an inclined shaft-furnace, with the back slopping toward the front; at a little distance above the tuyeres the front recedes more abruptly from the back. The internal dimensions are, from breast to back, 2 feet 7 inches, and from side to side 2 feet 6 inches. It has three tuyeres, having a diameter of only $1\frac{1}{4}$ inches, and a pressure of blast equal to about 24 inches of water, or about one pound upon the square inch is used. This blast is produced by a blowing-cylinder, 24 inches in diameter, and having a 24-inch stroke. The blast passes into a chest or reservoir, and is thence conducted by pipes to the furnace.

The fuel used is coke, (that in all the other furnaces, with the exception of the crucible-furnace, being Vandyke coal,) which is obtained from Pittsburgh, and costs, delivered at the works, about \$28 per ton.

The fluxes used are hematite iron-ore, which is obtained from Rawlins, and costs about \$15 per ton, delivered, and a little lead-slag, of which plenty can be had in the neighborhood. The charge is composed as follows: Rich alloy, 250 pounds; iron-ore, 180 pounds; coke, 55 pounds; and a little lead-slag. After a good heat has been raised in the furnace the charging is commenced; the coke is first thrown in and spread evenly over the surface. The rich alloy is then charged, being all fed against the front of the furnace; the iron-ore and lead-slag are then thrown in, mixed together, and spread evenly over the furnace. Three of these charges are worked in one hour, so that about 16,000 pounds of alloy are passed through this furnace in twenty-four hours. The heat is maintained so low that the furnace at the feed-door is perfectly black and quite cool; the only flame visible being a small reducing flame running up the inside of the front of the furnace. Owing to the peculiar construction of the furnace, the charge gradually sinks and meets the sudden incline, whence the alloy passes down to the zone of fusion, in the center of the furnace, without touching the walls, and is not melted until when within a few inches of the tuyeres. By this process the copper is obtained as matter, and the gold, silver, and lead in the form of a highly enriched lead. This rich alloy is tapped off about once in every hour and a quarter, and the slag about every five minutes. This slag is received in cast-iron pots, where it is allowed to solidify before being turned out. The slag is almost entirely free from lead, and contains only a trace of silver, so that practically it may be considered clean. The bars of silver are now taken to the cupelling furnace. This is in appearance not unlike a very short reverberatory furnace with a very large grate; but in place of the usual bed are a couple of bars, on which is supported the cupel, or, as it is usually called, the "test."

The test consists of an elliptical frame of wrought iron, filled in with bone-ash well beaten, and hollowed out to the requisite shape by means of special tools for that purpose. At the back of the furnace are two holes, one where the blast-pipe enters and the other for introducing the rich bars into the test. The test, which is placed with

its long axis towards the blast, is left a little thicker at the opposite end where the litharge flows over. When the test has been raised to a good heat, a sufficient quantity of the rich lead is introduced, and the whole speedily melts, and the blast is now turned on. The oxygen of the air oxidizes the lead into litharge, and this takes up all foreign metals. A portion of the litharge is absorbed by the test, but much the larger quantity flows over the end of the test furthest from the blast, and is received in iron pots mounted on wheels, which are moved as fast as filled. The rich lead is continually added until all has been oxidized, and the silver is now pure, containing only the gold in the bullion. If, however, there should happen to have been more copper in the enriched alloy than could be carried off by the lead contained in it, (which is shown by the appearance of greenish spots floating on the silver,) this can be easily removed by the addition of a little more pure lead to the test.

Immediately on the termination of the cupellation a very beautiful phenomenon is seen, which is termed the "brightening." Just as the last trace of lead clears from the silver a peculiar bright and vivid flash seems to cover the whole bath of metallic silver, and for an instant every brick in the arch of the furnace is reflected as plainly as in a mirror.

A series of ingot-molds, set in a frame, are then run under the test, and through a hole bored in the bottom of the test all the silver runs into the molds.

These ingots are now taken to the crucible-house, and about 35 pounds put into a plumbago crucible and melted. A little charcoal is thrown into the crucible, and the whole stirred with a stick. After skimming off the coal and any little slag which may have formed, the metal is poured into ingot-molds of the requisite size, and the silver, which is now fine, is, after assay, stamped with its degree of fineness.

This finishes the whole operation, as the gold and silver are not separated at these works.

Owing to the fact that all these operations are not proceeding at one and the same time, the number of men employed is comparatively small (being only thirty-five) when the large amount of work done comes to be considered.

These works have been erected, not only with a view to convenience, but also to economy, the whole establishment, together with the purchase of the land, (twenty-five acres,) having cost not more than \$58,000. It may be remarked here that the total loss of lead in all these operations does not amount to more than $2\frac{1}{2}$ per cent.

Our thanks are due to Mr. Sieger, the able and efficient superintendent of the works, and also to Mr. Billing, the manager, for affording us every facility in their power to enable us to make a thorough investigation, and also giving us all the information we could desire to give a description commensurate with the importance of this new and inestimable enterprise.

I have inserted the foregoing article on the Germania works, as published in the Salt Lake Tribune. But I wish to add that the statements in the article, in regard to losses during the various manipulations, ought to be received with caution. The statement that in smelting the lead-zinc-silver alloy in the shaft-furnace, the copper which may be present is obtained in the shape of matte, is manifestly incorrect. There appears no sulphur in the charge, (unless it be assumed that there is sufficient for the purpose in the coke,) and the copper will therefore undoubtedly be found in the rich lead. Besides, there never could be a copper-matte formed in the shaft-furnace without taking up considerable lead and silver, which would be altogether undesirable.

CHAPTER VII.

COLORADO.

By the courtesy of Hon. George M. McCook, governor of the Territory, who has placed at my disposal the report of the territorial assayers; by the active co-operation of these gentlemen themselves, who, in view of this use to be made of their reports, exerted themselves to produce thorough and trustworthy discussions of the mining-industry in their respective districts; by the earnest and judicious assistance of Mr. J. F. L. Schirmer, superintendent of the Denver branch mint, Mr. J. H. Jones, agent of Wells, Fargo & Co. at Denver, and other citizens; and finally, by the observations which my deputy, Mr. Eilers, and myself were enabled to make during a somewhat extended though rapid tour in the Territory, I am enabled to present a very interesting and full account of the condition and progress of mining in Colorado.

The following comparative statement for the years 1870, 1871, and 1872 is compiled from the careful estimates made for me each year by Messrs. Schirmer and Jones, whose opportunities and qualifications for obtaining accurate results are unsurpassed. I give the items in detail, instead of comparing the totals only, that it may be clearly seen how the different elements of the total have varied:

Gold and silver, coin value.	1870.	1871.	1872.
Express shipments.....	\$2, 160, 000	\$2, 820, 000	\$2, 295, 411
In private hands from Denver, estimated.....	120, 000	140, 000	50, 000
Matte.....	884, 000	923, 000	1, 019, 498
Ore shipped.....	286, 000	500, 000	981, 556
Southern mines, estimated.....	100, 000	130, 000	140, 000
Northern mines, estimated.....	50, 000	50, 000	50, 000
Used by manufacturers, estimated.....	75, 000	100, 000	125, 000
Total.....	3, 675, 000	4, 663, 000	4, 661, 465

According to this exhibit the product of the Territory for 1872 is about the same as for 1871, the great falling off in express shipments, due to the depression of the industry of Gilpin County, being counter-balanced by the increase in the production of matte and shipping-ores, due to the increased prosperity of Clear Creek County.

The distribution of the product for 1872 among the respective counties and districts is partly shown by the detailed reports which follow. But the total obtained by adding all the exact sums reported would fall far short of that above given. It is impracticable to employ exclusively the method of calculating the bullion at the points of production or at the points of shipment. In the above statement the returns and estimates are based on the movements or destinations of metal and ores. The item of \$1,019,498, classed as matte, represents really the reported purchases of the Boston and Colorado Smelting Company at Black Hawk, at the presumed actual value of the ores, not the price paid for them. The several items are:

Gilpin County	\$419,850
Clear Creek County	406,648
Park County	118,000
Boulder County	75,000
Total	1,019,498

The actual shipment of matte from these works during the year was considerably less, (probably not in excess of \$800,000,) and the difference represents the increase in the reserves of ore in their yard and roasting-heaps at the end of the year.

The following summary, classed as to counties, was published in January, in the Mining Review, of Georgetown, Colorado:

Clear Creek	\$1,503,391
Gilpin	1,389,289
Boulder	346,540
Park	238,000
Lake	133,000
Summit	125,000
All other sources	50,000
Total	3,785,220

That this estimate is too low can be easily demonstrated by an analysis of some of its items. The amounts of *ores* shipped or sold to the Black Hawk works are the same as in my statement; but the aggregate of *bullion* estimated is below that of the actual shipments of bullion reported to me on the authority of Mr. Jones, agent of Wells, Fargo & Co. at Denver. Relying upon the accuracy of his report, and also the judiciousness of his estimates (supported by the opinion of Mr. Schirmer, superintendent of the mint) for gold not turned over to the express company, but either consumed in local manufactures or carried in private hands out of the Territory, and shipped, if at all, from points beyond its boundary, I present the following comparisons of the bullion-product in gold and silver, ores and furnace-products not reckoned:

THE MINING REVIEW.		MESSRS. JONES AND SCHIRMER.	
Clear Creek	\$223,187	Express shipments	\$2,295,411
Gilpin	959,439	In private hands:	
Boulder	271,540	From Denver	50,000
Summit	120,000	Southern mines	140,000
Lake	133,000	Northern mines	50,000
Park	30,000	Manufacturers	125,000
Total	1,737,166	Total	2,560,411

The difference of these totals, \$823,245, is within \$53,000 of the whole difference between the total production of the Territory, as given by the Mining Review, and the production as given by Messrs. Jones and Schirmer.

Mr. Valentine, of San Francisco, general superintendent of Wells, Fargo & Co., published in January a statement of the precious metals produced in 1872 west of the Missouri River, in which the following figures are given for Colorado:

Gold by express	\$1,657,952
Silver by express	279,799
Ores and base bullion	1,064,000
Carried by private hands	None.
Total	3,001,751

The too early preparation of this statement perhaps explains the fact that no single item of it can be made to agree with later and more exact information. It is nearly three-quarters of a million below the estimate which I have just shown to be, by at least an equal amount, too small. Entertaining, as I do, a high respect for Mr. Valentine's great executive ability and general intelligence, I am compelled, nevertheless, to dissent widely from his conclusions regarding the bullion-product in almost every instance, except those of California and Nevada, where I substantially agree with him.

Returning, after these explanations, to the comparative statement first presented, it will be observed that, for the first time in the history of the Territory, Clear Creek County has surpassed, in the production of the precious metals, its earlier settled and exploited neighbor, Gilpin. The prospects for the future industry of both are set forth in the detailed reports which follow. I find in the exhibit for the year no cause to retract the favorable opinion heretofore expressed concerning the mineral resources and the facilities for mining possessed by Colorado. Of the criticisms contained in former reports, particularly with reference to the excessive and unjustifiable projection of exploring-tunnels, it is sufficient to remark that they have been fully justified by events, as is now generally admitted by all parties. The "tunnel clause" of the present United States mining-law, framed in the interest of such enterprises, has produced much dissatisfaction among prospectors, and will doubtless become practically a dead-letter, or be amended or repealed.

CLEAR CREEK COUNTY.

The able report on this county was prepared by Mr. Herman Stoeltz, the territorial assayer at Georgetown, who wishes to acknowledge valuable assistance by Mr. B. F. Napheys. To the same gentleman I am indebted for a very full account of the mining operations in Summit County.

Georgetown.—Since the last report a great change has taken place in mining affairs in Clear Creek County. The "tunnel excitement" has subsided in a certain degree, and the year 1872 has witnessed more solid development and material progress in Griffith and Argentine districts than any other year since their organization. The eager desire to "sell out," characteristic perhaps of the early years of almost all mining-camps, has in a great measure been abandoned, and been replaced by the energy of actual work. New discoveries of veins of great size and richness, and the steady development of a largely increased number of the older lodes, have had their effect in increasing the ore and bullion production of the districts named.

The burning of the large mill of the Stewart Silver-Reducing Company in January, 1872, and the extraordinary severity of the winter, had a somewhat depressing influence on ore-production. After the burning, of the mill none but the higher grades of ore could be disposed of, and these only at reduced prices as compared with rates previously paid. The consequence of the lack of mill capacity for the treatment of the second-class ores produced in the district, is quite as severely felt at the close of the year as at the commencement. The new Stewart Mill is kept fully employed in reducing but a portion of the second-class ores from the Pelican and Terrible lodes. The Brückner Cylinder Mill, leased by Palmer & Nichols, being run by water-power, has treated but a comparatively small amount of ore, and is in such a bad state of repair that but little can be expected from it until completely renovated.

The mill of Messrs. Crosby & Judd just commenced operations at the close of the year, and is undergoing a series of changes and consequent delays, seemingly inevitable in all new mills. The one other mill in this section of the county, that of Professor Dibbin, in East Argentine, is kept fully employed during the season of active operations in treating the ores from the mines in its immediate vicinity. These, and the Swansea Smelting-Works, (noted under the head of Empire,) comprise the present reducing facilities of this part of Clear Creek County, and are entirely inadequate for the treatment of the ores produced. It is true that a large amount of ore has been shipped to Professor Hill's works in Black Hawk; but this has been ore of a grade sufficiently high to stand the freight (\$15 to \$20 per ton) to that point, or such ore of lower grades as could not be disposed of at Georgetown to either pre-buyers or metallurgical works. These works, then, while relieving somewhat the pressure in the ore-market, have served for the disposal of certain grades of ore only, and the many hundreds of tons of ore, of the value of 40 to 100 ounces, now produced here, are still comparatively valueless. That this condition of affairs operates to the great disadvantage of the miner, cannot be doubted, since this low grade of ore is now either left in the mines or else scattered through the dumps, and too often wasted.

The true prosperity of this mining-camp can only be realized when the lower grades of ore are utilized; and this will probably be done when Georgetown has railroad communication with the valley, which will be within from nine to twelve months.

Notwithstanding the drawbacks mentioned, the progress of the county has been highly satisfactory. The town of Georgetown has grown in wealth and population; and the other mining-camps in the county have participated in the general prosperity. The cost of living has been considerably reduced, while the price of labor has reached a point which, while remunerative to the laborer, still permits the development of the mines.

The Stewart Mill was at once rebuilt, and recommenced operations in July. Several important improvements were made in the mill, which increased both its capacity and the thoroughness of the work done. Prominent among these may be mentioned the employment of a large reverberatory furnace for the preliminary roasting of the heavy ores, (containing a large percentage of zinc-blende, iron-pyrites, and galena,) previous to their passage through the Airey furnace.* A system of saving the tailings, after a partial rough concentration, has been adopted; and the mill is now apparently giving full satisfaction to both its owners and its patrons.

Of the older mines, the Terrible, Brown, Coin, Cashier, Phoenix, Dives, Silver Plume, Snow-Drift, Clift, Magnet, Argentine, Gilpin, Compass and Square, Equator, Belmont, International, Steven, and others continue to be worked with satisfactory results.

The more recent discoveries and such of the older ones as have been developed only since last year, comprising the Violet, Curry, Saco, John Bull, Nirvot, Hidden Treasure, Polar Star, G. Rogers, Lucky, Matilda Fletcher, Hopewell, Pay Rock, Pelican, Eagle Bird, Antelope, Maine, (Cold Stream,) Eureka, Seven-Thirty, Hercules, Old Missouri, Atlantic, Shively, Killbride, Brick Pomeroy, New England, and many others are in active operation, and yielding large amounts of valuable ore.

* The Stetefeldt furnace has been introduced in place of the Airey since this report was written. I presume the preliminary roasting will no longer be required.—R. W. R.

Of the tunnels but little can be said. Work has been carried on in but very few of them, and this without any actual result, except, perhaps, in the case of the Marshall Tunnel, in which it is reported that a large vein of fair ore has been found. The short upper tunnel of the Marshall Company has been producing ore.

The glowing promises and expectations of the promoters of the enterprise have not yet been realized, and it is quite probable that very many of the tunnels, on which considerable work has been done, will never resume operations. Others, such as the Marshall and Burleigh Tunnels, may be pushed to completion, and be made, when the lodes, which they cut, are developed in depth, useful for drainage, ventilation, and the delivery of ore. But at present the results from prospecting by tunnels are in the highest degree unsatisfactory.

A large amount of money has been expended in the work already done, in addition to the other large amount paid for "tunnel-sites," on which to do this expensive and unproductive work. No dividends have been paid, except, perhaps, in one or two isolated cases, in which money received from sales of stock has been used for this purpose.

On the whole, the tunnel excitement in Clear Creek County has been productive of no good, but, on the contrary, has been of very considerable detriment to the true interests of the county. Aside from the numerous cross-cut tunnels, generally of short length, which have been driven to cut deposits of ore known to exist, there are about twenty tunnels in the county driven across the course of known belts of lodes, and it is a reasonable estimate to say that nearly or quite 10,000 feet of tunnels have been driven, at an average cost of about \$30 per foot. To say that this has been an entirely useless expenditure of money would be hardly just; but it was certainly a premature and ill advised investment of money, which was needed in other and more legitimate mining enterprises.

A large proportion of these tunnel enterprises had nothing but the simple right to drive ahead in a certain given direction for a certain number of feet, and, necessarily, had to depend for hopes of profit either on ore from "blind lodes," struck in their course, or on ore from lodes already owned by other parties. In the one case, the hope of remunerative results was vague, uncertain, and, up to the present date, entirely and wholly illusory; in the other, nothing but a species of dishonest procedure could realize profit, since, in the event of the striking of a body of rich ore at a great depth from the surface in a vein owned by outside parties, much time would necessarily elapse before the continuity of the vein from the surface could be proved, during which time the parties driving the tunnel would be at liberty to extract all the ore within their reach on either side and below them. To properly realize what this would amount to, it is only necessary to consider the time which would be consumed in sinking a shaft, say, 500 feet, a depth less than the average distance below the surface at which the majority of the speculative tunnels would hope to cut veins of known value and richness. Only the fact that none of these tunnels have proven to be the highly profitable ventures they were once supposed by many to be, has prevented the actual prosecution of these *quasi* dishonest programmes.

The question as to the greater cheapness of mining through long and deep cross-cut tunnels alone, it is, perhaps, not necessary to discuss here, as in the event of work being actively commenced on any one of the lodes cut by any of these tunnels the question would settle itself, and it would at once be found just how far mining could be carried on

from below upward without having communication with the surface other than by the tunnel which cut the vein. My opinion that such tunnels may be a valuable, and, indeed, a necessary auxiliary to shafts, is sufficiently well known.

As the character of the ore found in a mining-district determines the proper method of its treatment, a glance at the different combinations of the various valuable metals found in Clear Creek County may not be uninteresting.

In the eastern end of the county the lodes were formerly worked for the gold-ores which they contained at and near the surface; and the deeper ores are still found to contain varying amounts of gold; yet now the ore even of that section of the county may properly be called silver-ores, since the larger part of their value is in silver.

The ore is generally a mixture of two or more sulphides, such as iron and copper pyrites, galena, zinc-blende, gray copper, and occasionally the rarer true silver-ores. Coming westward, up South Clear Creek, a number of lodes of gold-ores, *i. e.*, auriferous copper and iron pyrites, are found; but since only a slight degree of development has been attained in them, and already the presence of galena is to be noted, the belief is suggested that at greater depth the gold-contents of the ore will be replaced by an equivalent or greater silver value. The occurrence in the vicinity of large veins of argentiferous galena strengthens this view. In Empire, however, the lodes are characteristically gold-bearing; yet the circumstance, that as greater depth is attained the silver-contents of the ore seems to be increasing, may not be without significance.

In Griffith district the ore may be described as argentiferous galena and zinc-blende, occasionally intermixed with iron and copper pyrites, and with the silver-ores proper, such as ruby and brittle silver, silver glance, &c.

At and near the surface the ores are more or less decomposed; but in depth the sulphides are found free from the products of decomposition. As the surface-ores are small in amount compared with the other ore produced from the mines, it is fair to say that the ores of the district are varying mixtures of galena, zinc-blende, and iron pyrites. The other minerals found with these, such as gray copper, ruby and brittle silver, stephanite, stromeyerite, and argentite, although adding greatly to the silver-contents of the ores, are properly but accidental constituents.

The occurrence of a small amount of gold in the ores of some lodes of Griffith district may be mentioned as a curiosity rather than as of practical value, since the amount of such ore is insignificant. Such of the metallurgical works of the county (apart from the two smelting-works at Swansea and Spanish Bar) as treat the ores produced in Griffith district, employ a chloridizing roasting, followed by amalgamation in barrels or iron pans. The reverberatory furnaces employed for the roasting of the ores in the earlier years of this mining-district, have given place to the more improved and economical appliances of modern times, prominent among which are the Stetefeldt furnace and the Brückner revolving-cylinder, the former being in use at the Stewart Mill, and the latter at the Germania Reduction-Works, and at Professor Dibbin's mill in East Argentine.

Of the adaptability of the Stetefeldt furnace for the treatment of the heavy ores of Clear Creek County, nothing can yet be said, as the changing of Stewart's Airey furnace into a Stetefeldt furnace is just now going on. It is to be hoped, however, that this furnace will meet with the same degree of success in treating the ores of this county as it has achieved at other points where it is employed.

The merits of the Brückner cylinder have been mentioned in former reports. This furnace has advantages that are much to be commended. The ore is completely under control, both as regards the time of roasting and the degree of heat to which it is to be subjected, and is continually in motion during treatment, thereby more certainly undergoing a complete desulphurization and chlorination. The results obtained are good; a high percentage of the silver is chloridized, and the bullion is fine. Only a small amount of wood is consumed per ton of ore treated; and with a mill of a capacity of 20 tons per day the amount of labor required is small. On the other hand, the amount of "scrapings" and "screenings" (lumps and masses of roasted ore from the sides of the cylinder) is large when compared with the weight of the charge treated. These lumps, however, are chiefly produced in the treatment of those ores only which contain a large percentage of lead. No trials have ever been made to ascertain whether these scrapings, &c., are not sufficiently well chloridized to be amalgamated. The probability is that they are quite as well fitted for amalgamation as the lumps from the Stetefeldt furnace. The practice in the cylinder-mills here has been to crush and reroast such lumps, with the addition of a very small percentage of salt.

The establishment of Messrs. Crosby & Judd, of which mention has been made above, is the last built of the Georgetown reduction-works, and is furnished with the Crosby furnace. This furnace consists of an inclined reverberatory through which the ore is passed by mechanical stirrers, and also a shaft-furnace, down which the ore is dropped after its passage through the reverberatory. The mechanical stirrers are attached to and moved by iron pipes passing through both walls of the furnace, through which pipes a stream of water is constantly passing. At the point where the ore falls through the shaft salt is added, being fed by a mechanical contrivance which both crushes the salt fine and also regulates the amount delivered. The mill is supplied with a ball-grinder, which prepares the ore for the furnace, and amalgamation is effected in iron pans. The mill is well arranged for economy of labor, being built in terraces, on the upper one of which the ore is delivered by wagons.

The power used is obtained from the west fork of South Clear Creek, and is ample for all the purposes of the mill. Concerning the metallurgical efficiency of the system here employed I prefer not to pronounce judgment at present.

The several mills in the vicinity of Georgetown, engaged in the treatment of silver ores, now receive only the second-class ores, that is, ores containing less than 200 ounces of silver and but a small percentage of lead. The remaining ores are either sold to ore-buyers in Georgetown, who ship them to Germany, England, or the East, (Chicago, Omaha, Saint Louis, New York, &c.,) or are sold to Professor Hill, at Black Hawk, or to the smelting-works at Swansea, Spanish Bar, or Golden City.

There are four works here engaged in crushing the ore and preparing it for shipping. The ore is crushed and rolled sufficiently fine to obtain a good average sample. The sampling is done either by the common way of quartering down the whole lot of ore until a quantity sufficient for a sample is obtained, or by forming a ring of the ore instead of a cone, and taking two opposite quarters of it, and by repeating this operation reducing the sample to the proper quantity. Still another method is in use. The crushed ore is shoveled over a kind of scoop, about 1½ inches wide and 12 inches long, which will catch a small proportion of each shovelful.

Dr. J. G. Pohle, engaged in crushing ores, has been experimenting with a mechanical sampler of his own construction. The ore is elevated to a hopper, from which it falls on a sheet-iron cone 24 inches in diameter and 12 inches high. This is provided with four slots cut in the sheet-iron in such a way that lines drawn from their two corresponding courses will meet in the head of the cone, being about 1 inch wide at the head and 6 inches long. That portion of the crushed ore which in rolling over this cone will fall through the slats, (about 6½ per cent. of the whole bulk,) constitutes the sample, which is collected by a funnel under the cone, and is, if the amount should be too large, subjected to the same process again. The remainder of the ore falls into a hopper, from which it runs directly into ore-bags. The whole machine is cased in, and the sample is out of reach during the process. The machine answers its purpose apparently well, there being only slight differences in the assay of samples taken by the ordinary way and that of the machine.

The price paid during the year by ore-buyers averages about as follows:

Assay ounces per ton.	Paid per ounce (currency.)
250.....	\$0 80 to \$0 85
300.....	90 to 95
350.....	95 to 1 00
400.....	1 00 to 1 05
500.....	1 05 to 1 10
600.....	1 10 to 1 15

These prices were paid for average quantities of ores; in case much lead was present, the prices paid were better, averaging about 5 cents per ounce more, or \$1 for every per cent. of lead above 30 per cent., and if the ores were very zincky, a corresponding deduction was made. The scale of deduction made by Professor Hill is as follows:

Zinc present.	Up to 100 ozs.	100 to 150 ozs.	150 to 200 ozs.	200 ozs. and more.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
2 to 5 per cent. deduct	3	2½	2	1½
5 to 10 per cent. deduct	6	5	4	3
10 to 15 per cent. deduct	9	7½	6	4½
15 to 20 per cent. deduct.....	12	10	8	6
20 to 25 per cent. deduct.....	14	12	10	8
25 to 30 per cent. deduct.....	16	14	12	10
30 to 35 per cent. deduct.....	18	16	14	12

With an average ore the difference between the silver value of the ore and the price paid for it, according to the above price-list, is as follows:

Ounces per ton.	Difference per ton.	Ounces per ton.	Difference per ton.
250.....	\$155 to \$142	400.....	\$169 to \$149
300.....	156 to 141	500.....	166 to 141
350.....	165 to 147	600.....	193 to 163

being a margin of about from \$145 to \$175 per ton in favor of the ore-buyers, the cost of crushing, sampling, assaying, sacking, and shipping to New York being about \$50 to \$55 per ton. That this is an exorbitant

charge on the miner of the ore is very evident. The freight-item alone should be sufficient to pay all costs of reduction in properly-constructed reduction-works at home.

The mining-industry of the county demands the establishment of thorough metallurgical works, in which all the ores raised in the county could be thoroughly and economically treated, and in which not alone the silver, but also lead and other valuable metals could be saved. Such an establishment should be provided with an ample amount of capital, and be prepared to pay cash for any and all kinds of ore offered.

Regarding the rich silver-ore of the Georgetown districts the plan to be pursued might be: 1. Very careful hammer-dressing of the ores in order to separate as much as possible the galena from the zinc-blende, by which would result: *a*, galena-ores, *b*, dressing-ores. 2. Treatment in complete dressing and concentrating works, the products of which would be:

a. Smelting-ore:

aa. Galena.

bb. All other products of the dressing-machinery assaying over a certain amount, say 250 to 300 ounces per ton.

b. Amalgamating-ores:

aa. All such products of concentration containing not enough silver or lead to be subjected to smelting, but consisting mainly of zinc-blende and iron pyrites.

bb. All "tailings" and slimes too rich to be thrown away.

c. Tailings too poor to be subjected to further treatment.

The main principle upon which such concentrating-works should be managed would be not to subject any of the finer products of crushing to any dressing whatever, on account of the great loss of silver which would inevitably result, owing to the frequently very fine distribution of the silver-ores proper through the gangue, and their specific gravity. By such a process it would be possible with little more expense to save a great proportion of the lead contained in the second-class ores, now entirely wasted, and to have the amalgamating ore nearly free of galena, the great obstacle to chloridizing wasting.

Concerning the treatment of the amalgamating-ores, it would probably be found that leaching with a solution of hyposulphite of soda, after a thorough chloridizing roasting of the ores, would be found to be a cheaper and better method than amalgamation.

The smelting-works would consist of roasting-furnaces for the preparation of the ores for treatment in blast-furnaces for lead riches; and probably reverberatories of iron pyrites could be had cheaply to make a matte from such ores as did not contain enough lead to be smelted for lead riches.

Many of the ores, principally those extracted from the lower workings of the mines, contain a large percentage of zinc, in fact so much that it has become quite difficult to dispose of such ores. In such dressing-works, as above referred to, the second-class ore derived from the dressing-machinery would contain a high percentage of zinc. Proper works could treat this ore for zinc, and the remaining residue for silver.

Below is appended a brief notice of some of the more important mines of the districts around Georgetown. The Pelican lode, probably the richest in Griffith district, is situated on Showman Mountain, about 700 feet above the level of the creek. The vein was first opened in May, 1871, and since that time has been constantly under development. The crevice is very wide, increasing in places as much as 20 feet.

The ore-vein, varying in thickness, but always present, is from 6 inches to 4 feet of first-class ore, while the amount of second-class ore, *i. e.*, mineral mixed with gangue, is very great, some of the lower workings in the mine showing as much as 12 feet of this class of ore. The lode has been opened by a series of cross-cut tunnels, connected with shafts in the vein, and the length of drifts now open is nearly 2,000 feet. All the ore produced from the Pelican mine, and it amounts to over \$500,000 in value, has been produced from these drifts and shafts, as no stoping has been done.

The ore produced is of the character usually found in the lodes around Georgetown, galena, zinc-blende, with stromeyerite, gray copper, and silver glance, specimens of which, weighing several pounds each, have been found. The first-class ore varies in value from 350 to 1,000 ounces, the second-class ore runs from 15 to 250 ounces, and a very large amount of third-class ore worth 50 ounces per ton can be readily mined whenever there is a market for ore of this grade. The peculiar state of affairs existing in Clear Creek County regarding the disposal of ore, has prevented the raising of any but high-grade ore from this mine. The first-class ore from the Pelican is now shipped to Europe, and a small amount of the second-class treated at the Stewart Mill, but, as before stated, no effort is being made to raise any amount of mineral, only such as is mined in the work of opening the lode being disposed of, and not all of this.

A very careful estimate of the value of the ore in sight is that it is worth \$1,500,000, and recent developments in the shaft sunk from the lowest level increase this sum.

The ore found in the lowest working is of good quality, and in places is found in solid veins of 3 feet in thickness. All things considered, the Pelican is the most valuable lode of silver-bearing ore in the Territory, having the largest crevice and the greatest amount of rich ore. The owners, Messrs. Streeter & McCunniff, have confined their operations only to the opening up of reserves of ore, and of doing other work in the development of their property.

On the Brown lode, since its sale to Mr. S. B. Chaffee, the present owner, considerable work has been done, all operations being based on the necessity of placing the mine in good shape for future working, by sinking shafts, running drifts, &c. The ore-yield of the mine has, consequently, been small.

In the Terrible mine work has been constantly and vigorously prosecuted, and probably nearly one-half of the ore milled by Mr. Stewart was second and third class ore from this mine. The greater part of the improvements made on this lode has been on the west part of the vein, owned by the Terrible Silver-Mining Company, the yield of which has been 110 tons of the first-class ore, worth \$500 coin per ton; 556 tons of the second-class ore, worth \$135 coin per ton; 857 tons of the third-class ore, worth \$45 coin per ton. This company has built a mill-tramway from the mouth of its tunnel to the ore-house at the foot of the mountain, and has adopted a rough system of concentration by hand-jigs, by which it has dressed 145 tons of second-class ore from the third-class ore, 8 tons of which was rated as first-class, and shipped with their other first-class ore to Europe.

In the eastern part of the lode the Clark Mining Company has been mining with success. The first-class ore, about 30 tons, was shipped to Europe. This mine has been much hindered in its development by the lack of proper facilities for the treatment of second and third-class ores. The Terrible lode alone could nearly keep the Stewart Mill fully em-

ployed. The Cold Stream lode, formerly the Maine, is being placed in a condition to yield a steady supply of ore, of which an abundance is to be found below the upper workings, which gave the Maine its prominence. It is proposed to sink two shafts and connect them at proper intervals by levels. This will be a work of time, and, inasmuch as nearly all the ore within reach was extracted before the mine was sold, the yield of the mine during the last half of 1872 was not as great as in former months.

The Hercules and Seven-Thirty lodes (two locations on one and the same vein) have been extensively worked during the year, although litigation between the owners of the two lodes has, undoubtedly, interfered with the yield of the vein. The ores from these mines are rich, and their total production has been about 175 tons of a value of over \$50,000. It is to be hoped that the suits between these two mines will be settled during 1873, and that their development may proceed without any further disturbance.

The Cashier lode, on Sherman Mountain, has been but little worked by the company owning it, and its ore-production has been almost all from lessees' work.

The Iron-Drift and Silver Plume have been in constant and active operation during the year, and with remunerative results.

The Dives lode, and also the Laura Dale, in the same vicinity, have been worked during the year with highly satisfactory results.

On Brown Mountain, about one mile west of Brown Gulch, a belt of lodes has been discovered and opened during the summer, of which I may name the Atlantic, Pacific, Shively, Kilbride, and Brick Pomeroy, all of which carry regular seams of 2 to 6 inches of very high-grade ore, assaying from 425 to 650 ounces per ton on an average. On Brown Mountain the old Missouri, Coin, Silver lode, Mammoth, Glasgow, and others have been actively worked.

On Sherman Mountain several other lodes besides those mentioned above have been in active operation, namely, the Hopewell, Payrock, Eagle Bird, Antelope, Eureka, &c.

On Democrat Mountain a group of lodes, prominent among which are the Cliff, West Junction, Lucky, Gala, Polar Star, Providence, and Fred Rogers, have been opened and yielded a considerable quantity of good ore. These lodes have all been developed to a greater or less extent, and have most excellent prospects. A wagon-road up Broad Creek would greatly facilitate the development of these mines, and provide for the easier delivery of their ores, which, so far, are mainly those usually found on the surface of all the lodes in this vicinity. They are of a high grade. These lodes are all being actively worked.

The Saco lode, situated on Leavenworth Mountain, is one of the late rich discoveries that have stimulated mining affairs in this vicinity. The lode is opened by a series of drifts and shafts connected with a cross-cut tunnel. The ore from the lode is rich, and has assayed as high as 1,330 ounces per ton in mill lots. The total of ore mined during the last five months (since the discovery) has yielded the owners somewhat over \$55,000.

Other lodes in the same locality, such as the John Bull and Ni-wot, near the Saco, have been worked with most satisfactory results, the ore furnished by these lodes being of remarkably high grade, containing as much as 1,500 ounces per ton by mill samples. The amount produced is difficult to estimate, but is large.

The Equator, once one of the leading mines of the district, has been leased to a number of miners, and from their workings, mainly in the

surface-openings of the lode, much rich ore was taken. There seems to be no probability of the early resumption of work by the company owning the mine.

The Argentine, a large vein of argentiferous galena, late in the year furnished quite an amount of ore of a desirable grade and quality. The percentage of lead in the ores from the Argentine is large, and its silver contents are as high as 175 ounces per ton.

The Gilpin or McClellan, worked on a lease, has been productive, and has, without doubt, paid a good profit to those working it.

Of the other lodes located on Leavenworth Mountain, which have been worked during the year, may be mentioned the Ocean Wave, Colorado, Central, Hidden Treasure, Compass and Square, Alabama, O. K., &c.

The Stephens lode, situated in West Argentine district, has been constantly and profitably worked during the year, yielding an average of 30 tons per month of good ore, averaging 150 ounces in silver per ton, with a high percentage of lead. This lode is owned by a company who are conducting their operations with economy and ability.

The International, Belmont, Owlet, Fortunatus, Corey, &c., have also been worked more or less, being somewhat dependent on climatical changes.

Even a short description of the many lodes that have been in operation during the year would take up too much space, and, therefore, the notice of those given above must suffice.

In general, it may be said that nearly all of the older mines that have been productive in former years have been in operation during the past year, and that the result of their workings is in the highest degree favorable. The later discoveries, nearly all of which yielded unusually rich ore, have had their share in increasing the ore-product to an amount very much greater than in any previous year.

The mines in the eastern end of the county have been worked to a greater extent than in any year since their surface-ores were treated for the gold they contained. The ores still contain more or less gold, but notwithstanding this fact, the lodes carry now mainly silver ores.

The principal mines are the Seaton, Crystal, Edgar, Whale, Kukill, Veto, Queen, and Franklin, and the ore obtained was almost entirely shipped to the works of Professor Hill, at Black Hawk. The establishment of smelting-works at the Whale Mill, at Spanish Bar, and the completion of the mill at Masonville, (Airey furnace,) will give a home-market for the ores of this section of the country. The yield from the mines mentioned above has been large during the past year, and bids fair to be still larger during 1873.

Attention has been again turned toward the placer-mines of South Clear Creek, and in the bars along that stream. The yield of gold from this source during 1872 has been about \$24,000 coin, and it is very probable that this yield will be largely increased during the coming year. Mining on these bars will be carried on in future in a more systematic manner, and steam-power will be employed for drainage in such of the claims as need it. Drifting on the pay-streak in the heavier deposits of gravel will be done, and all the modern and more improved appliances of placer-mining will be used in such of the claims as will permit of hydraulicking or sluicing.

It is highly probable that work will be commenced in the mines in Cascade, Trail Run, and other districts that have been neglected during the past few years.

Cascade district contains a number of silver and gold bearing lodes, the ores of which are found in large quantity. Means of reduction are

needed there, and when these are furnished there is no reason why this district should not furnish a valuable addition to the product of the county.

Trail Run and other neighboring districts contain a large number of gold-bearing lodes, prominent among which may be mentioned the Cayote, Kelly, and Freeland. Under proper management, and with a remunerative home-market for these ores, these districts will be again populated by busy and prosperous miners.

Between this section of the county and Georgetown is a scope of country which, although more or less worked in former years, has been for some time neglected. The ores contain both gold and silver, some of the veins being characterized by unusually heavy bodies of low-grade argentiferous galena. Under the stimulus of improvements in neighboring districts, and the advent of a railroad up the valley of South Clear Creek, these districts will again receive the attention which their veins warrant.

As we approach Georgetown the value of the ore found increases, and a short distance below the junction of the Empire Fork with South Clear Creek several lodes of proved value are now being worked. These lodes, prominent among which are the Oshkosh and New England, contain the same character of ore as is found around Georgetown, and the ore seems to be of high grade and in good quantity.

The prospect for the coming year is in the highest degree favorable. The Miners' Reduction Company, a home organization, under the superintendency of J. A. Stewart, propose to erect a large mill, with a Stetefeldt furnace, during the coming year; and it is probable that a mill with ten Brückner cylinders will replace the now worn-out mill of the German Reduction-Works.

The completion of railroad communication between Georgetown and the valley will have a great effect in increasing the amount of ore mined in the county. The awakening of new interest in the gold-mines of Empire and other auriferous districts assures a full supply of iron and copper pyrites for the matte smelting-works at Swansea and Spanish Bar, under the stimulus of which there is no doubt but that the more unknown and unworked districts, Daily, Cascade, Trail Run, &c., will receive their due share of attention.

The results of the mining operations in Clear Creek County during the past year have gone very far toward establishing a general degree of confidence in the mineral wealth of the county, and all legitimate mining enterprises, based on good property, will hereafter be very much more successful than in former years.

The amount of ore raised and disposed of in the county during the past year is not less than 5,860 tons, and the bullion product is as follows:

	Bullion product, coin.
Stewart S. R. Company worked 1,059 tons	\$126,432 50
Putmer & Nichols worked 198 tons	32,911 98
Judd & Crosby worked 50 tons	3,842 95
Swansea and Whale (matte) worked 250 tons	35,000 00
Gold, (mainly from Idaho)	25,000 00
International Mill, (Professor Dibbin) worked 150 tons	42,000 00
Total of gold, silver, and matte, coin value	265,187 43

The following is the amount of ore bought and shipped to the East and Europe:

Name of buyer.	No. of tons.	Contents in ounces of silver.	Coin value.
William Light	191	47,750	\$61,741
J. P. Airey & Co.....	235	47,000	60,771
F. T. Marshall.....	385	146,272	189,130
William Bement	121	40,000	51,716
Terrible Lode Mining Company	110	44,000	56,892
Terrible Lode Mining Company, (East).....	30	12,000	15,516
J. G. Pohle.....	140	58,520	75,666
J. Snider.....	154	59,293	76,665
G. C. H. Gray	244	98,128	126,880
Jay W. Smith, L. G. Colkins, Bagley & West, Snowdrift mine, Silver Plume mine, W. W. Glenn	416½	81,162	104,942
Various small lots	30	9,000	11,637
Total	2,056½	643,125	831,556

Average coin-value of all ore shipped to the East or Europe, \$404.35.

In addition to this there was shipped to N. P. Hill's works, at Black Hawk, 2,125 tons, containing 314,500 ounces, worth \$406,648 coin.

The total production of Clear Creek County is therefore as follows :

	Coin.
Bullion and matte.....	\$265,187 43
Ore shipped East, &c.....	831,556 00
Ore sold to N. P. Hill	406,648 00
Total	1,503,391 43

The above does not include the value of any ore mined awaiting treatment, or in process of treatment, but represents the actual value of the ore worked or shipped during the year 1872.

Empire.—In Upper Union district, and about four miles from Georgetown by the wagon-road, is situated the town of Empire. Upper Union district was located in 1860 by a party of prospectors and placer-miners from the "Gregory Diggings," now known as the Central City Gold Region. The existence of gold below and on the slopes of Silver Mountain was soon an established fact, and the basis for extensive operations. Ditches were constructed, and the other preliminary work of a placer-mining camp done. The yield of the precious metal at once rose to a large sum, and the existence of Empire and Upper Empire was assured.

A comparatively small amount of skill and knowledge is necessary for success in any rich mining-camp, and fortunes were soon made in Empire, but too often quite as quickly lost.

The history of this district is by no means an uninteresting one. Rich placer and surface quartz from lodes were quickly discovered, and yielded their golden contents readily. The two towns soon assumed importance; stage-lines provided communication with the outside world, merchants established their stores, labor was abundant and well remunerated, and such rude and semi-barbarous luxury as the distance of the place from civilization would permit, was freely indulged in. Champagne suppers, celebrated "big runs," and whatever else money could procure in Colorado was to be had in the city of Empire. But, unfortunately, a very few years of such mining as was in vogue in Empire from 1861 to 1864, sufficed to exhaust the placer-grounds; and surface-quartz is only too apt to terminate in "cap" or in iron pyrites.

The rise of Empire was rapid, and its fall was nearly as rapid. With iron pyrites came a cessation of big runs; champagne suppers were soon too costly for the miners' or mill-men's pockets, and a migration of the floating population to some "pound diggings" in other more favored parts of the Territory began. Six stamp-mills, with 94 stamps, were soon idle, since with the knowledge of treating pyrites then extant in the county these mills could no longer be run with success.

The district had produced nearly \$2,000,000 in gold, and had supported a population of about 1,000 men. A number of large and valuable lodes had been found and developed to a certain extent, that is, all the surface-quartz had been extracted, and "cap" or iron pyrites reached. About this time it was discovered that gold lodes had a marked value in New York, and soon the era of stock-companies and speculation set in. Greenbacks were plenty in Empire again; new mills were erected, and the "process mania" took entire possession of too many of the eastern superintendents. The history of Colorado in this respect is the history of Empire. Everything, from superheated steam to tobacco-juice, was tried on Empire ores. Glowing promises of success made to Eastern stockholders were succeeded by disastrous failures, and confidence in the resources of the district was again shaken when assessments instead of dividends were the outcome of all endeavors and hopes.

A year of such work sufficed, and as company after company suspended operations, often deeply in debt, work for the laborers of the community was not to be had. The population of the district rapidly melted away, and soon but a corporal's guard of men, too deeply interested or too confident of final success to leave the place, remained behind. The town, with its pretty houses, was nearly empty; the once constant fall of the stamp was heard no more; and a district filled with rich lodes and all desirable facilities for working them, was left in a Rip Van Winkle sleep to await the day of cheaper labor and the advent of a method of treating "rebellious" ores. Such, in brief, is the history of Empire, a district characterized by the great size of its veins and the abundance of auriferous iron and copper pyrites contained therein.

With the advent of railroads into Colorado came a better-educated class of men; the reckless superintendents of former "flush" times took their departure, and were succeeded by men interested in the successful working of the mines under their charge. The smaller stockholders in Eastern companies withdrew, and soon a few men of wealth controlled the operations of the largest companies. The establishment of the works of the Boston and Colorado Company, (Professor Hill's,) in Black Hawk, and its success in thoroughly treating the ores of that section, gave new energy to those interested in the mines of Empire.

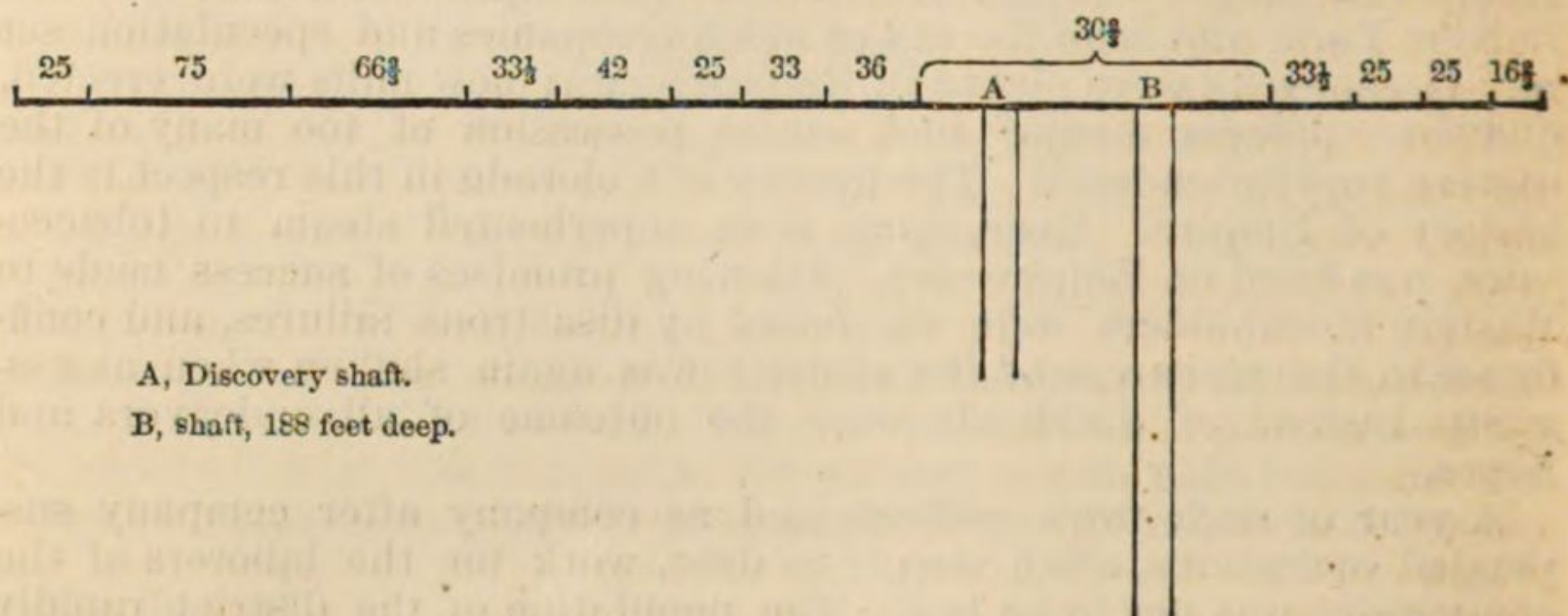
The building up of Georgetown, and the successful working of the silver-ores of that region, began to attract attention to the other mineral resources of Clear Creek County, and the patient, constant few who had stood by Empire once more took heart.

During the early part of 1872 the Swansea, Colorado, Smelting and Silver Mining Company "limited," an English corporation, commenced the erection of smelting-works at Swansea, a point at the junction of the Empire Fork of Clear Creek with South Clear Creek, and the mine-owners of Empire began to think of their long-deserted gold-mines on Silver Mountain. During the year Dr. George C. Munsen, agent for F. Schuchardt & Sons, of New York, now the owners of the property of the former Knickerbocker Gold-Mining Company, of the Tenth Legion,

and other gold-bearing lodes in Empire, began operations on the Tenth Legion.

To resume operations on the property of a defunct company is often quite as difficult a task as to commence *de novo* on an untouched vein. Such at least was the case regarding the Tenth Legion, for in addition to the legacy of rickety shafts and poorly-timbered drifts, left by reckless miners and superintendents of former times, the excessive subdivisions of the lode interfered with its thorough development.

The following sketch shows the condition of the lode in this respect; the figures attached to the different subdivisions represent each the length of the property of a separate owner:



That such a subdivision of the lode is injurious to its profitable working is evident, and we can but hope that the efforts for the consolidation of the smaller interests will be crowned with success.

The Tenth Legion is a large vein, the crevices between walls seldom being less than $9\frac{1}{2}$ feet wide. In the bottom of the deeper shaft, 188 feet in depth, and the one through which future developments will be prosecuted, there are two veins of ore, one on the north side of the crevice of 3 feet, and one on the south side of 4 feet, separated by a "horse" of 2 feet 4 inches in thickness. In re-timbering this shaft, and at a depth of 96 feet from the surface, a vein of iron-pyrites of, at first, 4 inches in thickness was found, which afterwards increased to over 2 feet of solid ore. This new vein, of which no former record is to be had, differs in dip from the apparent dip of the main one, but is probably part of the vein separated by a "horse" from the larger part of the lode. The ore from this vein is rich in copper, carrying as high as $12\frac{1}{2}$ per cent. of that metal, together with 7 ounces of gold and 20 ounces of silver per ton. In the bottom of the deep shaft the ore averages well, the results from thirteen samples, assayed by Dr. John Torrey, of New York, being \$84 gold per ton. The mine, as at present opened, will furnish about 8 tons of ore per day, and, what is worthy of notice, only one-third of this is stamp-mill ore, the remaining two-thirds being pyrites so well concentrated as to be fit for the immediate use of the smelter. It is the intention of the present owners of this lode to reserve all smelting-ore, and sell the same to either or both of the two smelting-works now established in Clear Creek County. The remaining ore will be crushed in the stamp-mill belonging to the same parties that own the mine.

The mill is located about one and a quarter miles from the mine, and is connected therewith by a good wagon-road. It contains 20 stamps and three pans, and is furnished with power from an 18 foot wheel, (with 8 feet face,) the water being conveyed through a covered flume from a substantial dam. The stamps now drop not to exceed 24 drops per

minute, and fall from 15 to 19 inches. It is proposed, however, to give them less fall and drop them at the rate of 40 drops per minute. The stamping-ore will be passed through the mill, and the tailings to a concentrator. The resulting dressed ore is to be treated in flat iron pans with the use of chemicals. The experience of Mr. Munson, gained in the former runnings of the mill and from experiments made on 500 and 1,000 pound lots within a year, has enabled him to treat iron-pyrites in the manner described, and at a cost for chemicals of not over \$1 per ton, with a high degree of success. The results from the last series of experiments, and with check assays of both ore and tailings, show that he obtained from 65 to 92 per cent. of the coin value contained in the ore treated, and the bullion obtained was from $\frac{800}{1000}$ to $\frac{858}{1000}$ fine in gold. This too was from stamp-mill tailings, and from raw ore, assaying about \$20 in coin per ton.

With a careful sorting of this ore into two grades at the mine, and the treating of the stamp-mill ore in the manner described, the management leaves but little more to be desired. The smelting-ore will find a ready market, and will materially assist in the development of home industry, by permitting a larger amount of the silver-ores of the county to be treated in Clear Creek County, the iron-pyrites being very desirable as a fluxing-material.

Particular mention has been made of the Tenth Legion lode, for the reason that this is the first of the many good lodes of this district in which work has been resumed. In addition to this, there may be named the Silver Mountain, Liebig, Humboldt, Rosecrans, Gold Dirt, Conqueror, Atlantic, Livingston County, and Great Equator lodes, all more or less developed by shafts or tunnels, and all capable of yielding a large amount of gold-bearing ore, carrying more or less copper.

It is highly probable that, during the coming year, nearly all the above-named lodes will be in active operation. The work of connecting the Silver Mountain lode with one of the tunnels of the Bay State Mining Company is now in progress, and, as but a short distance remains to be driven, it is probable that this valuable vein will be productive in a short time.

Mention has been made of the works of the Swansea Colorado Smelting and Silver-Mining Company, located a short distance below Empire. The method of treating ores in this establishment is identical with that of Professor Hill's in Black Hawk, *i. e.*, a smelting for matte, in which is concentrated the gold, silver, and copper contained in the ore treated. The company began operations in April last, and have had, owing to the difficulty in procuring a sufficient supply of iron-pyrites, only about one month of steady work.

The works have both steam and water power, and are provided with a large crusher and rolls. A number of kilns, of a capacity of 10 tons each, are used for the preliminary roasting of such of the ores as need it. A reverberatory roasting-furnace is also used for this purpose. A smelting-furnace (reverberatory) receives the roasted ore and fluxes, and the matte and slag are obtained in a manner similar to that of Professor Hill's. The works, which have at present a capacity of 8 tons in twenty-four hours, are under the management of Mr. Richard Pearce, and seem to be managed with the same degree of skill and business-tact that characterizes the investment of foreign capital in metallurgical works in this Territory. The workmen are nearly all English.

At present the matte is shipped to Swansea, Wales, for further treatment, but it is the intention of Mr. Pearce to shortly make the proper arrangements for the extraction of the silver from the matte produced

by Ziervogel's process, the remainder of the valuable metals to be separated in Swansea, to which place the matte, after treatment, will continue to be sent.

With the certainty of a large and constant supply of iron-pyrites from the Empire mines, and which the recommencement of mining in that district seems to assure, the works will certainly be enlarged during the coming year. Almost any amount of silver-ores can be obtained from the mines of Griffith district, and the future of the establishment is a promising one. With plenty of ore of a good grade in both gold and silver, and with wood at \$4.25 per cord, with a certainty of a railroad passing within a few hundred feet of the works within nine or twelve months, there can be no good reason why the ores, both of silver and gold, of the western part of Clear Creek County should not be thoroughly and economically treated at home. Owing to the difficulties mentioned above, the production of the works for the year 1872 aggregates but \$20,000 coin.

SUMMIT COUNTY.

This county, the least populous, though not least prosperous in the Territory, is the extreme northwestern county in Colorado, and embraces the area west of the main range, and north of $39^{\circ} 31'$ north latitude, being about one hundred and fifty miles in an east and west and one hundred and fifteen miles in a north and south direction, and including, within these limits, about seventeen thousand square miles of surface.

A number of passes across the main range afford an entrance into Summit County, the principal one of which is the Tarryall Pass, from the head of Tarryall Creek (a tributary of the Platte) to Breckenridge. A wagon-road from Georgetown to Montezuma also exists, but, owing to its unfortunate location, and the steep grade on which it is built, it is but little used, except during the summer months, and then only as a trail for jack-trains, and for travel on horseback.

Aside from a partial development of a few of the mineral resources of the county, and this, too, in the small area around the headwaters of the Snake, Swan, and Blue Rivers, the county is, to-day, nearly as wild and unimproved as it was when first entered by white men. Dense bodies of timber cover the mountains, extending from the timber-line, which is, on an average, about 11,000 feet above sea-level, to the valleys of the stream.

These valleys are covered with heavy growths of nutritious native grasses, prominent among which are red-top, timothy, blue-grass, bunch-grass, white-clover, and wild oats. They are admirably adapted for grazing purposes, and probably for the raising of the more hardy of the small grains.

The principal towns of the county are Breckenridge, the county-seat, and headquarters of the placer-mining interest, situated on the Blue River, and Montezuma, a small mining-camp on the Snake, the post-office, and depot of supplies for the Snake River mines.

The principal business of the county is placer-mining, which has been steadily prosecuted since 1860, and which has been generally remunerative to those engaged therein.

Within the scope of country extending from the head of the Swan to the head of the Blue River, and down this latter stream for a distance of about twenty miles, are a number of tributary gulches emptying into the Swan and Blue Rivers, and it is in these gulches that most of the

placer-mines of the county are to be found. Aside from the mineral resources of the county, the most prominent object of interest are the Hot Springs, situated on the Grand River, and reached by a good trail from Breckenridge. These springs are remarkable for their size, and for the temperature of their waters, which is 112° F. at the point where the water issues from the earth. The water has a decided sulphurous taste, and a not unpleasant sparkle. The springs are in good repute, and are much frequented by Indians as well as whites.

The population of Summit County is extremely variable, being greatest in summer when the mining is at its height, and dwindling down to a comparatively small number in the winter-months, a condition of affairs peculiar to a country that relies solely upon an industry which is dependent on the seasons for its successful prosecution.

There are four saw-mills in the county, and lumber is worth from \$30 to \$35 per 1,000 feet, the latter price being for sluice-lumber.

Labor, during the mining season, commands from \$3 to \$5 per day, averaging about \$3.50 per day for the season. During the past year about two hundred and fifty men have been engaged in mining and accessory work, such as ditch-building, &c. The total product for the year, including the value of the ore and lead riches shipped from the Snake River mining-camps, will not exceed \$125,000 coin value.

During the past season the process of "booming" has been inaugurated in Summit County. This consists in collecting water in a proper reservoir, of large capacity, and discharging a great volume of it at once, thereby removing an amount of gravel impracticable by any other means. Notwithstanding the great volume of water used, and the amount of gravel kept in motion in the flume in a state of thick mud, the results seem to be favorable as regards the collection of gold. Large areas of ground can be worked by this method, which cannot be mined profitably by other ways. Ground which, by the ordinary hydraulic process, pays \$3 per day to the hand, can be made to yield \$25 a day. The extensive application of "booming" to many of the gulches of Summit County cannot fail to raise the gold-yield of the county.

Commencing in the extreme southern part of the mining-districts of the county, and on the head of the Blue River, the first mining-camp is that of Bemrose & Co., in Hoosier gulch, a tributary of the Blue River. This company is working in an old side-channel in good pay-gravel, overlaid with cement. Four men are employed during an average season of only two and one-half months, caused by the early failure of water at the location worked, which is over 10,000 feet above sea-level. The ground pays about \$12 per day to the hand employed.

In this immediate neighborhood is situated the Vanderbilt, a free-gold lode in quartzite. The crevice is irregular, varying from 6 to 12 inches in width. The ore averages well, and many exceedingly rich specimens have been found. The lode is not being actively worked.

On the hillside of the second gulch north of Hoosier gulch is situated the Hunter lode, a vein of silver-bearing ore, opened by a shaft of 30 feet in depth. The ore-vein varies from 3 to 8 inches in thickness. The ore consists of galena, gray copper, and blue and green carbonate of copper, and carries from 40 to 1,000 ounces in silver per ton. Several tons have been shipped to Newark, New Jersey, averaging about 300 ounces per ton.

On the Blue River, a short distance above, south of Breckenridge, Messrs. Crone & Fuller are sluicing on a side-bar, employing three men for an average season of four months, the ground paying about \$5 per day to the man.

Below this claim Messrs. Sheppard & McNasser have ground opened preparatory to booming next season.

Immediately below Breckenridge, in what is known as "Klack's gulch," probably an old side-channel of the Blue River, Greenleaf & Co. (Springfield Mining Company) are employing twelve men. They are using a 3-foot flume, dumping into Blue River. The ground is paying finely.

Opposite Breckenridge, in Lomax gulch, the same firm is booming, employing three men, with fair results.

On Corkscrew patch the same firm is booming, employing two men. The ground is not yet fairly opened, but prospects well.

Jones & Hunter are mining in Yuba Dam patch, below Breckenridge, employing two men in booming; pay averages \$7 per day to the hand.

In Iowa gulch Adams & Stahl are booming, employing six men. During the past season the gulch has produced about \$6,000, the length of the season being about four months.

On the same hill, and south of Iowa gulch, Hopkins & Hoopes have opened ground preparatory to booming. The ground prospects well.

In Illinois gulch, a tributary of the Blue, and emptying into that stream just above Breckenridge, Colonel Fuller is mining. He is also booming in Mayo gulch, a tributary of Illinois. He employs four men. The ground pays about \$10 per day to the man.

Above Mayo is Pacific gulch, also a tributary of Illinois. Messrs. Hopkins, Hoopes & Blair have here opened ground preparatory to booming. The ground prospects well.

In French gulch, emptying into the Blue a short distance below Breckenridge, a number of companies are mining. In the head of the gulch Messrs. Martin Day & Co. are sluicing in the gulch and booming on the hill-side, employing four men; pay good. Connors & Cobb, in Rich gulch, a tributary of French, are preparing to boom during the next season.

C. P. Clark is sluicing in French gulch and booming in Lillian Vail patch. He employs eight men with good results. McFarland & Todd are next below, in French gulch, employing two men; pay fair. The Badger Flume Company come next. The pay here is poor, the bed-rock not having been reached.

In Negro gulch, a tributary of French, T. H. Fuller is preparing to boom, with very favorable prospects.

Mower & Haugs, on Stilson's patch, in French gulch, are sluicing with three men, using a hydraulic; pay good.

Sisler & Co., below, use sluices, employing two men, with fair results.

The Blue River Mining Company come next in French gulch, using sluices and a hydraulic. They employ five men; pay fair.

The U. S. Grant Mining and Smelting Company is the lowest company in French gulch, employing seven men; pay fair.

North of French gulch is Gold Run, a somewhat noted gulch. In this locality D. Walker with three men, Moffat & Co. with four men, the Tiffin Gold-Mining Company with four men, L. Peabody with six men, and G. Mumford with ten men are sluicing with excellent results.

On Delaware Flats, east of Gold Run, A. Delaine with three men, and Canfield & Johnson with two men, are doing well.

On the side-hill, between Delaware Flats and Galena, the claims of Twibill & Stogsdale are located. The firm employ eight men, and have the best paying ground in the county, the gross yield of which for the past season has been nearly \$25,000.

In Galena gulch the Galena Mining Company with eight men, and Kiland & Coatney with four men, are sluicing with good results.

On the Swan River, below the mouth of Georgia gulch, Clegg & Young are putting in a bed-rock flume, employing four men. The bed-rock has not yet been reached. The prospects of the enterprise are favorable.

In Georgia gulch George Twist is working three men; pay good.

In Humbug gulch P. Iversen employs two men; pay fair.

In American Gulch Hitchcock & Stomes are employing three men in sluicing; pay good.

Messrs. Greenleaf & Co. are building a large ditch to carry the water of the three forks of Swan River to the head of Humbug gulch. The ditch, when fully completed, will be about thirteen miles in length; it is 4 feet wide and 4 feet high, flumed for the entire distance, and will carry 1,500 miners' inches of water. The ditch has throughout a grade of a quarter of an inch to carry 12 feet. This ditch will command the largest extent of ground left unworked in the county, and will doubtless prove a remunerative enterprise.

Twelve miles below Breckenridge Salt Lick gulch is being worked by four men. Water is brought from Ten Mile Creek. The pay is good.

Comparatively little lode-mining was done in the county during the past season. In Snake River district considerable prospecting was done and with favorable results. In Montezuma the Saint Lawrence Company worked the Silver Wing lode, and succeeded in developing a fair-sized vein of pay-ore, specimens from which were remarkable for the amount of ruby silver contained therein. The mill of the company is a substantial structure, containing ten stamps and an Airey furnace, which, however, has not been tested yet. The mill is not quite in running order. On Bear Creek, a tributary of the Snake, and about one and one-half miles above Montezuma, is located Saint John, the seat of operations of the Boston Silver-Mining Association, W. L. Caudler, superintendent. This organization, although owning much other valuable property, are developing only the Comstock lode, a large vein, the ore of which carries much galena. The development of the mine has been described in former reports, since which time, excepting stoping ore and the commencement of another tunnel, designed to cut the vein at a depth of 700 feet from the surface, but little has been done in the mine. Since the last report a large mill has been built, finished late in 1872, and a few tons of ore treated before the severity of the winter suspended operations.

The mill is built so as to receive the ore from the ore-house, where it is dumped from the tram-way conveying it from the mine. On its entrance into the mill it is dumped by the side of a large Blake crusher, and then either fed into the stamp-battery of ten stamps or passed through the crusher and rollers and then elevated to screens preparatory to dressing. If the ore is suited for amalgamation it is passed from the crusher to the ball-grinder, and from this machine to the proper bins, from which it is conveyed to the roasting-furnace.

Such of the ore as consists of galena associated with baryta and quartz, and carrying but little gray copper or other brittle ore of silver, is passed through the sizing and dressing machinery. The latter consists of, first, two continuously-working jiggers on the same floor with the stamps. These jiggers are designed for stuff of from $\frac{1}{4}$ to $1\frac{1}{4}$ inches diameter, and pass their tailings, if worthy of further treatment, directly to the stamps. From the stamps the now finely-crushed stuff passes, secondly, three "spitz-cutters" which size it, the coarsest going, thirdly,

to two other continuously-acting jiggers, designed for stuff of from $\frac{1}{2}$ mm. to 1 mm. in size; and the finest, fourthly, to two of Rittenger's continuously-working shaking-tables, which treat the slimes. The ore now being prepared for smelting is dried and passed to the roasting-furnaces, two in number. These furnaces have three floors, and are designed to each treat eight tons in twenty-four hours. Passing from one floor to the other the ore is desulphurized, and in the lowest hearth is converted into silicate of lead. The charge is drawn in a liquid condition into a sand-bed on the ground-floor of the furnace-house, and, when cold, is broken up and taken to the shaft-furnace, which is about 10 feet in height, and having three common tuyeres. This furnace is built of fire-bricks made of material found near the works, which have stood perfectly the test imposed upon them. The furnace-walls are one brick thick, and are bound with hoop and flat iron. The blast is supplied by a McKenzie blower, driven by a small steam-engine. What lime is necessary for a flux is obtained in the Snake River Valley, a few miles below the works. The working results of this method of beneficiating the ores of the Comstock lode are most excellent. The slag from the shaft-furnace is clear of silver or lead, and the lead produced is soft and of a good quality. At this point the operations of the company cease, and the pigs of lead riches are shipped to the East for separation.

The amalgamation-ore, after being subjected to a chloridizing roasting, is further treated in two of Wheeler & Randall's pans, furnished with proper settlers, &c. The amalgam, after retorting, is smelted into bars, assayed and stamped, and in this state shipped East.

Among the prominent discoveries of the year may be mentioned the veins found in what is known as Geneva district, a section of country embracing the main range between Peru district and one of the numerous heads of the Platte River. The district, geographically, is partly in Park and partly in Summit County, but owing to its distance from the settled portion of Park County, is practically a Summit County mining-camp. A number of promising veins have been located, prominent among which are the Revenue, Starr, Overland, and Loraine lodes. The Revenue has two shafts of about 20 feet in depth, and carries a vein of pay-ore of about 1 foot in thickness. The ore consists of gray copper and galena, and is rich in silver, assays varying from 100 to 800 ounces of silver per ton. The returns from a lot of about 8 tons shipped to Georgetown and there crushed, show that the first-class ore yields nearly 500 ounces per ton. The lode is remarkable for the large amount of gray copper contained in it, and for the presence of beautiful specimens of native sulphate of copper. The other lodes of this district have been but little developed, but all show more or less of the same characteristics as the Revenue. The Overland carries 6 feet of mixed galena and gangue, and assays nearly 1,000 ounces to the ton.

There is scarcely any doubt but that this district will prove to be one of the best located during the year.

GILPIN COUNTY.

Mr. A. von Schulz, territorial assayer at Central City, has furnished the report on this county.

The mining-industry of Gilpin County has not made that progress during the last year which the richness of the gold-mines promised. The monthly production has, in comparison with former years, fallen off during the past summer and winter, but has at present (end of the year) reached again about \$80,000; this amount not including the ship-

ments of auriferous and argentiferous copper matte of the Boston and Colorado Smelting-Works, which may be safely put down at \$60,000 per month more.

The rather stagnant condition of mining in the gold-region may be attributed to several causes, on account of which many, or rather the largest part, of the Gilpin County mines are idle.

Everybody has been waiting for facilities for cheaper and more profitable working of the mines than were heretofore in existence. The great cry has been for a railroad; and if a railroad will really benefit this part of the country so much as is generally believed, the fact ought now to become apparent, a narrow-gauge road being finished to Black Hawk. This privilege of having connection by rail with the East and West has been obtained at a considerable cost, the voting of \$250,000 in bonds to the Central City Railroad Company, whereby the tax on the whole taxable property of Gilpin County is raised to nearly 2 per cent., and it is therefore the more to be hoped that the completion of the road will really give new impulse to the mining-industry of the county, as has been expected. The rates of freight will be reduced; fuel and labor will command lower prices; capitalists, who heretofore have been kept away on account of the tedious trip up to Central City and vicinity, and the poor accommodations which existed at that place before the new hotel was finished, will now investigate the resources of the gold-region more thoroughly, and invest, perhaps, convinced of the mineral wealth of the district, more judiciously than has been done up to this time. As mentioned before, most of those lodes which formerly added considerably to the bullion-production, are now, and have been, lying idle for the past two years.

The numerous companies on the well-known Bobtail, Gregory, Bates, Burroughs, and other lodes have been prevented from working, partly by internal troubles in the companies and partly by the drowning of their properties. It would lead too far to give reasons for this, to strangers and the uninitiated, seemingly causeless idleness of the best claims which were formerly paying so well; suffice it to say, that internal troubles in some of the companies, which had it in their power to drain pretty nearly the whole extent of two of the above named lodes, caused them to stop work, and the consequence was a suspension of operations on all these lodes on account of water. It is hoped, however, that as the drainage of one mine has been successfully undertaken by the enterprising owners thereof, (the Briggs Brothers,) and as this drainage will materially benefit some of the other claims, a general revival will take place on the whole line, which would give employment to over one thousand men. The Bobtail tunnel, started over a year ago, approaches its completion very rapidly, and will drain nearly the whole extent of the Bobtail lode, promising therefore a renewal of activity on the claims lying along it.

Another reason for the comparative inactivity of the mining-camp is found in the system of leasing claims, owned generally by companies, to single miners. This system does not tend to the perfection of a continuous and steady prosperity of the mining-industry. For a certain share of the net profits, payable to the company, these miners go to work, not always in the most approved manner, and take out the ore as long as it will pay them, caring little for a proper development of the property, and still less for the state and shape in which they leave the mine should they not "make it pay." They are certain to quit work the moment they run behind in the least degree. Should the company owning the mine afterwards have the intention of starting up work

on their own account, it finds the mine stripped and in such a shape that it would cause a large expenditure of money to put it into working order again.

The opening of newly-discovered districts and the higher wages in the neighboring silver-region about Georgetown have induced many prospectors and miners to leave this camp.

The most effective means, however, for bringing about a prosperous state of mining-affairs in Gilpin County would be a consolidation of the many small claims, taken up under the old mining-laws, in lengths varying from a few feet to several hundred.

To give an instance of this subdivision, the 800 feet at present located and partly developed in the original Bobtail lode are cut up into claims of respectively $43\frac{1}{3}$, $66\frac{2}{3}$, 72, $33\frac{1}{3}$, $66\frac{2}{3}$, and 128 feet; the 1,750 feet on the Gregory lode are owned by five separate companies, while the 2,347 feet on the Burroughs lode are divided into seventeen distinct claims; and so it is with nearly all the more prominent mines.

Mining, of course, becomes more and more expensive the deeper it is carried on, and it is a matter of no great calculation to see the necessity of a consolidation of these different claims in the near future.

Nobody who has followed the development of the resources of this gold-region in past years will have any doubt as to its future prosperity.

The opening and working of the innumerable lodes have nowhere shown a giving out of the precious metals, and when it has temporarily appeared so it must be attributed to only a local deterioration in the quality of the gold-bearing material, which will occur, more or less, in every mine and in every country.

The total production of Gilpin County for the year 1872 amounts to \$1,389,289. Of this amount \$959,439 were produced in bullion, purchased and shipped by the banks; \$419,850 represents the value of first-class ore from Gilpin County treated by the Boston and Colorado Smelting-Works, and \$10,000 worth of ore and tailings were purchased by the chlorination-works of Cash & Rockwell.

The shipments of the banks, as given in detail by the express office, are as follows:

Rocky Mountain National Bank.

	Currency.		Currency.
January	\$20,767	August	\$39,247
February	28,933	September	32,442
March	27,048	October	35,606
April	22,760	November	39,292
May	18,350	December	43,535
June	29,231		
July	35,646	Total	372,857

Thatcher, Stanley & Co.'s Bank.

	Currency.		Currency.
January	\$30,600	August	\$25,500
February	20,550	September	31,000
March	21,500	October	38,000
April	29,400	November	25,800
May	23,500	December	31,850
June	32,000		
July	49,500	Total	359,200

Nath. Youngs & Co.'s Bank.

	Currency.		Currency.
January	\$42,056	June.....	\$27,000
February.....	39,300	July.....	21,000
March.....	10,800		
April.....	24,796	Total.....	177,752
May.....	12,800		

Black Hawk Savings Bank.

	Currency.		Currency.
April.....	\$4,300	September.....	\$4,270
May.....	4,000	October.....	300
June.....	13,930		
July.....	14,250	Total.....	49,630
August.....	8,500		

The amount of milling and smelting ore raised, during the past year, is estimated at 90,000 tons, of which between 3 to 4 per cent. is smelting-ore, although the percentage of first-class ore can safely be placed at 10 per cent. Not more than 3 to 4 per cent., however, is sorted out as smelting-ore, the balance being sent to the stamp-mills.

The mill or second-class ore yields, on an average, from \$10 to \$12.50 per ton, while the value of the smelting-ore may be estimated between \$80 and \$100 per ton of 2,000 pounds.

Out of seventy stamp-mills, with 1,300 stamps, only fourteen, with 360 stamps, have been in operation during the past year. They are:

	Stamps.		Stamps.
Potter's mill.....	15	New York Mill.....	55
Clayton's mill.....	30	Kimber & Fullerton's mill.....	18
Whitcomb's mill.....	20	Polar Star Mill.....	32
Sullivan's mill.....	25	Berhaus & Miller's mill.....	20
Black Hawk Mill.....	50	Arrighi Mills.....	10
Lake Mills.....	20	Briggs Mills.....	25
Meade Mills.....	20		
Sensenderffer Mill.....	20	Total number of stamps.....	360

The Boston and Colorado Smelting-Works have purchased, according to Professor Hill's statement, during the year 1872, 9,650 tons of ore. Of this amount 6,950 tons were produced in Gilpin County, for which \$178,000 were paid at the works; 21,000 tons came from Clear Creek County, and realized \$320,000, while Park County furnished 600 tons of the above total, with \$88,000 valuation.

The 6,950 tons of ore furnished by Gilpin County include, however, about 3,000 tons of tailings, which, with a margin of the smelting-works of \$24 per ton, have a value of \$72,000. Taking, further, the average margin on ores at \$43 per ton, the remaining 3,950 tons of ore are worth \$169,850. If to these two amounts the above \$178,000, which the works actually paid, are added, we have the actual value of the product of first-class ore and tailings from Gilpin County, and bought by the Boston and Colorado Smelting-Works, amounting to \$419,850.

The works have enlarged their capacity by the addition of one reverberatory, of which there are now three in all, and one blast-furnace for the reworking of slags obtained by the treatment of zinciferous silver-ores. The blast-furnace has only been running for a short time, but it is the intention of the managers to start it up again as soon as the coke, which will be used instead of charcoal, arrives.

The Cash & Rockwell Chlorination-Works will be soon started up

again, for which purpose they have already commenced buying ores, (first-class and tailings.) They will increase their capacity if they should see a necessity for it.

Of the principal mines in Gilpin County the following have been worked, more or less, during the past year:

	Claim.		Claim.
California.....	1	Missouri.....	1
Forks.....	1	Sparks.....	1
Alps.....	1	Prize.....	1
Roderick Dhu.....	1	Jones.....	2
Kansas.....	4	Senderburg.....	2
Kent County.....	1	Mertu County.....	1
American Flag.....	1	Gould and Curry.....	1
Gardner.....	1	Fisk.....	3
Grinnell.....	5	Foot and Simmons.....	1
Casto.....	1	Bobtail.....	1
Union Pacific Railway.....	1	Briggs.....	1
Leavitt.....	1	Wood.....	1

The Bobtail tunnel, started for the purpose of draining the Bobtail and adjoining lodes and working them, has at present reached a length of 1,100 feet, and is only a few feet distant from the above-named lode. It crosses the Fisk 588 feet from its mouth, and will intersect the Bobtail between the Senderfffer and Trust Company's claims at a depth of 500 feet below the surface. The dimensions of the tunnel are 6 by 7 feet, with a fall of 6 inches in 100 feet.

The minimum number of feet driven per month was 36, the maximum number 78, costing on an average \$22 per foot, exclusive of timbering, tram-ways, flumes, &c. The total cost of the tunnel will be between \$35,000 and \$40,000.

The Wood lode, in Leavenworth Gulch, is at present principally worked for the pitch-blende (U₃O₈) it contains. The first lot of ore, amounting to 200 pounds, was sent to England, and sold for \$300, or \$1.50 per pound, assaying 67 per cent. of oxide of uranium.

From the last lot of 1,200 pounds no returns have as yet been received; and about four tons more are on the dump, not yet closely enough sorted. The mine is worked at a depth of 70 feet, this being the only instance where pitch-blende is found so close to the surface, the occurrence in Saxony, Bohemia, and Redruth, Cornwall, being found at much greater depth.

BOULDER COUNTY.

Mr. Lawrence Thompson, territorial assayer for this county, has furnished the following report:

Most of the mines of this county are worked by the original prospectors, or discoverers, and the want of reduction-works or an easily accessible market has operated in most cases to prevent production of ores beyond that incidental to exploration. Some few lots of ore have been occasionally sold, but there are no systematic accounts from which totals and values could be taken. The unusually heavy snows of last winter and spring have much delayed work, and limited it to the few summer months. The gold and silver mining districts of Boulder County commence about five miles from the foot of the mountains, on the east side of Gold Hill, and extend west some twelve miles in a direct line to the summit of the Snowy Range. They reach on the north and south the limits of the county, embracing an area of about two hundred and eighty-eight square miles.

The principal districts are Grand Island, Gold Hill, Sugar-Loaf, James Creek, and Ward.

Grand Island district.—The Caribou mine is located on Caribou Mountain, four miles east of the Middle Boulder or Dartt Pass, and is 9,800 feet above tide-water. This lode extends 1,400 feet on the surface, and its course is N. $82\frac{1}{2}^{\circ}$ W. The owner, Mr. A. D. Breed, has obtained a United States patent for the property.

There are in this mine eleven shafts, aggregating 1,248 feet in depth. The main or working shaft is 329 feet deep; another is 229; a third is 129, and eight others are from 20 to 100 feet deep. There are, also, four levels, aggregating 1,678 feet in length. The walls are not well defined, there being no regular selvages. The crevice may, however, be stated to be from 6 to 8 feet in width, and the paying part of the vein is from 6 inches to 4 feet wide. The ores of this mine are sulphurets of silver, argentiferous galena, brittle and native silver, with but little zinc-blende. They are easily reduced by chloridizing, roasting, and amalgamation.

Mr. Breed has kindly furnished from his books the following statements of the product from the time of his purchase, September 21, 1870, to October 1, 1872. Number of tons of ore mined and milled, 3,650 $\frac{3}{4}$; net profit per ton, \$90 currency. The present developments in the mine expose 34,082 tons of ore. In the bottom of the deep shaft, as well as in the 260-foot level, is a fine vein of first-class ore, 44 inches wide. Mr. Breed also owns and operates a mill at the village of Middle Boulder, four miles east of the mines, of which the following is a brief description:

The mill building measures 100 by 165 feet, and has five terraces or floors. The motive-power is steam, and the method of treatment is chloridizing-roasting in Brückner cylinders, and amalgamation in pans. Twenty men are required to run the works day and night, and 3,500 pounds of salt are used during the twenty-four hours. The bullion produced is from .850 to .950 fine, and the capacity of the works is from 18 to 20 tons per day.

Idaho. This mine is about one mile east of the Caribou lode, on what is known as Idaho Hill. The following facts in relation to it were furnished by Mr. J. D. Westover, one of the owners:

The main shaft has been sunk to a depth of 100 feet, at a cost of \$300, including timbering, shaft house, &c. Amount received for ores sold, \$9,985. Width of crevice 3 feet; width of ore-vein 12 to 24 inches.

The Perigo mine, one of the first discoveries in this district, contains gold on the surface, but it has had comparatively little development. During the past season the 4-foot vein has produced \$25 per ton in the stamp-mill. In the shaft, which is 40 feet deep, silver-ore of fine grade replaces the gold at a depth of 25 feet from the top.

Isabel. This is a recent discovery, lying about 300 feet south of the Caribou mine, and has a shaft of 35 feet in depth, with a crevice 5 feet wide, and an ore-streak of 10 inches. The first-class ore has been sold to the Boston and Colorado Smelting Company, of Black Hawk, for \$858 per ton; second class for \$229 per ton. Amount not stated. The third-class ore assays \$100 per ton.

Boulder County lode. This vein lies about two miles east of Caribou. There are eight shafts on it, aggregating 250 feet in depth; also 225 feet of levels and tunnels. It has produced during the past season 600 tons of ore, worth, by assay, from \$20 to \$150 per ton in gold and silver. Part of the ore was sold to the Boston and Colorado Smelting Company, and another part was worked by stamp-mill. That portion stamped yielded \$3,850 gold. The width of the crevice is 5 feet, and the width

of ore-streak 2 feet. I am indebted to Mr. Charles Sherman, one of the owners, for the above statements.

Sherman. This mine has two shafts, one 90 and one 40 feet deep. Width of crevice, 5 feet; width of ore, 25 inches. The Boston and Colorado Smelting Company have paid for the first-class ore from this mine \$376, and for the second-class, \$128 per ton. Cost of mining and marketing ore, \$50 per ton. Statement furnished by lessees.

Seven-Thirty. This mine is located immediately north of the Caribou mine, running parallel with it, and the claim is 3,000 feet in length. Mr. E. A. Hupper, one of the owners, and manager of the mine, furnished the following statement:

The main shaft is 75 feet deep, and 175 feet of levels have been run; average width of crevice $3\frac{1}{2}$ feet; average width of ore 12 inches. The entire expenditure in and about the mine, including shaft-house, building road to mine, &c., is \$3,922.24. The receipts from sales were \$5,837.60.

Grand View, on Caribou Mountain, has a main shaft 80 feet deep, and two other shafts aggregating 47 feet in depth. Width of crevice 3 to 4 feet, containing an ore-vein from 8 to 12 inches wide. Twelve tons of ore have been sold, for which \$216.50 per ton have been realized. About 25 tons of second-class ore are at the mine, the estimated value of which is \$50 per ton. The owners have expended in and about the mine \$2,320.25.

Bullion, near the village of Cardinal. One shaft has been sunk 30 feet deep. Width of crevice 4 feet. The rock yields in stamp-mill \$25 per ton in gold. Cost of mining, hauling, and milling, \$10 per ton.

The No-Name lode is owned by William Donnel & Company. One shaft has been sunk 55 feet deep. In sinking this shaft \$478 have been realized from sales of first-class ore, and \$140 for second-class. Width of crevice 4 feet; width of ore-vein 8 inches.

The Trojan lode lies near Cardinal. The main shaft is 130 feet deep, the east shaft 60 feet, and there are 100 feet of levels. This mine has produced 600 tons of ore, yielding in stamp-mill \$10 per ton in gold. Considerable ore from this mine has been sold for from \$120 to \$208 per ton. Width of crevice 4 feet; width of ore-vein 18 inches.

Sovereign People. This mine has three shafts aggregating 150 feet, the main shaft being 70 feet deep. First-class ore sells for \$175, and second-class for \$100, per ton. Width of crevice 4 feet; width of ore-vein 16 inches.

Arlington. The main shaft is 50 feet deep. The ore contains both gold and silver, yielding in stamp-mill \$13 per ton in gold; assay-value \$60 per ton.

Hetzer & McKenzie's stamp-mill is located at the town of Middle Boulder. It contains fifteen 500-pound stamps, and is run by water-power. Its capacity is seven tons per day. During the summer of 1872 it was run three months, producing \$5,643.65, gold. Cost of mill, \$3,000; cost of operating mill twelve hours, \$3;* cost of quicksilver, &c., per day, 50 cents. Wear of shoes and dies per month, \$125.

The Washington Avenue is situated on the divide between North Boulder and Four-Mile Creeks, and three miles west of Sugar-Loaf Mountain. This lode is a recent discovery, and is producing ores of high grade. The first-class ore yields by assay \$399 per ton, and consists of argentiferous galena with sulphurets of silver. The width of the crevice is 6 feet; that of the ore-vein, 20 inches.

* I give these figures as reported by Mr. Thompson; but they seem to me inexplicably low.—R. W. R.

Ward district.—The ores of Ward district are generally refractory, and but a comparatively small per cent. of the value can be saved by stamp-mills, owing to the failure to complete and run successfully the reduction-works at the Ni-Wot mine on the Columbia lode. Comparatively little mining has been done in the district during the year. Still the district is known to contain some of the most valuable lodes in Colorado, among which are the Columbia, (which has been opened by different shafts at short intervals for a distance of one and a half miles,) the Stoughton, Celestial, and others. The Columbia shows a strong vein for the whole distance explored. The average value of the first-class ore is about \$100 per ton. It is principally sulphurets of iron and copper, carrying a small amount of silver.

The Stoughton has a pay-vein of about 3 feet, the ore being sulphurets of iron and copper, first-class ore being worth \$175 per ton.

The Celestial has a pay-vein of about 12 inches, and has been worked during the past season to a limited extent, the ore yielding \$250 per cord, of about seven tons in the stamp-mill process. The first-class ore of this mine assays over \$200 per ton.

Gold Hill district.—The Red Cloud lode was discovered in May, 1872. Mr. John Evans, one of the owners and manager of the mine, furnishes the following statement: Depth of shaft, 75 feet; length of levels, 60 feet; width of crevice, 3 feet and 6 inches; product of mine from August 1 to December 31, 40 tons of first-class ore, with an average value of \$900 per ton, and 250 tons of second-class ore, worth \$100 per ton. This mine contains both gold and silver, and is remarkable on account of containing these metals in combination with tellurium, the mineral found being petzite. There have also been promising discoveries made during the season on the east flank of Gold Hill, which are now being developed. Among these may be mentioned the Phoenix lode, which has a shaft 35 feet deep, with a crevice of 4½ feet. Value of first-class ore, \$200 per ton.

The Blue Jay is also a recent discovery of some promise. There are several other valuable lodes on Gold Hill, which have been worked during the season to a limited extent, viz, the White Rock, Seven-Thirty, Twins, and Horse-Fall. The ores from these mines have been worked by stamp-mill.

A company has been organized by some of the most prominent business men of Boulder City, for driving a tunnel under Gold Hill from Left-Hand Creek, and work on the same is now being vigorously prosecuted. It is a work of some magnitude, and promises large results, as it will cross lodes of known value at a great depth.

Central district, or Jamestown.—This district is situated on James Creek, a tributary of Left Hand. The ores found here contain both gold and silver. Some of the mines produce large quantities of sulphurets of iron and copper, also much argentiferous galena, and some arsenical and antimonial silver-ores.

The crevices and ore-streaks are generally large, and would produce large quantities of low-grade ores; but owing to the want of adequate means for reduction, no mining has been done the past season. A number of new discoveries have been made and are being developed in different parts of the county. At the head of Four-Mile Creek, at Garden Gulch and at Williamsburgh, lodes have been opened, showing argentiferous galena in such quantities as to induce preparations for vigorous work during the winter.

Gulch-mining has been prosecuted to some extent on Four-Mile Creek,

about eight miles west of Boulder City, during the past summer, and about \$6,000 in gold was received at the Boulder Bank from this source.

PARK COUNTY.

For the following reports on Park and Lake Counties I am indebted to Edward D. Peters, M. E., late territorial assayer at Fair Play, who wishes to acknowledge the valuable assistance of Messrs. Mills, Stansell, McGraw, and Dudley.

Geology of the principal mining-districts of Park County.—From Fair Play to the base of Lincoln, Bross, and Buckskin Mountains, and following the whole course of the Mosquito range, there exist extensive gravel and drift deposits entirely covering the surface of the country. These deposits are all more or less auriferous, and include some of the best paying placers in the county. The bed-rock is a micaceous sandstone, containing much lime and alumina. The wash-boulders are mostly quartzite from the higher formations, plentiful but not large. From Horseshoe district, and probably still farther south, to Ute or Hoosier Pass, the primitive rocks are overlaid by three distinct formations, two of which might be subdivided into an immense number of strata: first, sandstone; second, limestone; third, porphyritic trap.

In many of the deeper gulches, and on several of the lower mountains, one or all of these formations have been scoured away. On Mount Bross the geological formations can be plainly seen. On the primitive schistose rocks rests a layer of metamorphic sandstone 1,500 feet thick. This is overlaid by limestone 1,800 feet thick, and this again is capped by porphyritic trap 800 feet thick. These figures are not absolutely accurate, but are correct enough to show the enormous thickness of the stratified silver and gold bearing rocks. The chemical and physical properties of the sandstone and limestone vary very considerably at different depths. I am not aware that any analyses have been made of these rocks, and can therefore give only one, which I made from the limestone directly below the Moose mine, elevation about 13,000 feet above sea-level:

	Per cent.
Carbonate of lime	84.3
Carbonate of magnesia	3.0
Silica	9.6
Moisture	1.4
	98.3

The principal gold-lodes are found in the lower strata of sandstone; the higher strata are traversed by numerous and extensive silver-bearing veins, carrying gray copper, zincblende, and galena, with quartz gangue, while in the higher limestones are found the enormously rich silver deposits which have rendered the Mount Lincoln district so famous. These deposits are characterized by the presence of galena, silver-glance, and gray copper, and have almost invariably a heavy spar gangue. I cannot learn that any paying mineral has been discovered in the trap.

Mineralogy of Park County.—The following list of the minerals of this county includes only those which I have myself examined and tested. I do not claim it to be full or perfect, simply correct:

Park County minerals.

Name.	Locality.	Description.
Native gold....	Placer and lead mines.....	Crystals very rare and imperfect. In laminae, flattened grains and shot.
Native silver....	Placer-mines; also lead-mine on Chalk Creek.	In nuggets and wires. In thin scales.
Graphite.....	In limestone on Silver Heels Mountain.....	Very impure; containing oxide of iron and earthy matter.
Molybdenite....	Silver Heels Mountain.....	In threadlike veins.
Argentite.....	In Silver Star, Moose, and other mines.....	Amorphous and laminated.
Galenite.....	In all the mines in both sand and limestone. Assays from \$3 to \$12 per ton, and as high as \$120 per ton in gold.	In simple and modified cubes, also in twins; also coarse and fine granular, the coarse being always the richer.
Alabandite (?) (Manganese blende, M. S.)	In some of the old gold-mines near Quartzville.	Massive.
Zincblende.....	In large quantities in the Mosquito gold-mines. Also in some silver-mines. Carries from \$10 to \$150 per ton in silver. Several specimens tested. Yielded cadmium.	Mostly massive. Highly ferruginous.
Pyrite.....	In all the gold-mines and in the silver-mines of Buckskin. Invariably auriferous, but seldom rich enough to be of value.	In simple cubes, pyritohedral, and massive. In the Phillips mine perfect cubes are found of enormous size.
Chalcopyrite....	Found in all the gold and most of the silver mines. The richest matrix for gold, often assaying as high as \$150 per ton; also, \$300 per ton in silver.	Crystallized and massive. Often iridescent. Beautiful variegated specimens are found in the Mosquito mines.
Marcasite.....	Phillips mine.....	Cellular.
Arsenopyrite....	Priest mine on Silver Heels Mountain.....	Massive.
Zinkenite.....	Sweet Home mine.....	In minute crystals.
Jamesonite.....	do.....	Capillary. So-called feather-ore.
Tetrahedrite....	Principal silver-ore of Buckskin district; assays from \$50 to \$300 per ton. Select specimens from Moose mine assayed \$5,200.	In complicated crystalline forms and massive.
Tennantite.....	Buckskin district.....	Crystallized.
Stephanite.....	In Moose and other silver-mines.....	Massive and crystalline.
Common salt....	At the salt-works and several mineral springs.	Massive and crystallized.
Horn silver.....	In small quantities in Wade Hampton mine. The Moose and other mines in the limestone formation carry from 5 to 20 per cent. of their silver contents in the shape of a chloride, but invisible to the eye.	Massive.
Carnallite.....	Salt works.....	Crystalline.
Fluorite.....	Sweet Home mine.....	Crystallized, massive; pink and violet.
Cuprite.....	Sacramento Gulch, Sweet Home mine.....	Minute crystals and massive.
Melaconite.....	Unknown mine at Montgomery.....	Massive and earthy.
Hematite.....	In many places in the park. Phillips mine Hamilton, Silver Heels. Hamilton, Silver Heels.....	Argillaceous. Specular. Fibrous.
Chromite.....	Silver Heels Mountain.....	Massive.
Rutile.....	On Ute Pass in veins of quartz traversing limestone.....	Crystallized.
Pyrolusite.....	Buckskin and Silver Heel Mountains.....	Massive.
Limonite.....	Extensive beds in the South Park.....	Earthy.
Quartz.....	In nearly every mine and in veins traversing the limestone strata.	Crystallized and massive.
Wollastonite....	In veins traversing the lower limestones.	
Pyroxene.....	In limestones and dolomite.....	In endless forms and varieties.
Amphibole.....	In schistose rocks at Montgomery.	
Garnet.....	do.....	Crystallized.
Epidote.....	In trap rock on summit of Mount Bross.	
Mica.....	Very abundant and in many varieties, especially near the junction of the sandstone and schistose rocks. I have noticed biotite, phlogopite, and muscovite.	
Feldspar.....	In many varieties in the schistose rocks. Have observed fine crystals of Labrador in trap.	
Tourmaline.....	In schist above Montgomery.....	Large black crystals. Both ends perfect.
Prehnite.....	In trap rock.....	In clusters of small crystals.
Apatite.....	In schist.....	Massive.
Barite.....	Principal gangue rock of the limestone silver-mines.	Crystallized and massive. Very abundant.
Anhydrite.....	Salt-works.....	Crystallized.
Gypsum.....	Various mineral springs.....	Crystallized and in sheets.
Melanterite.....	Sweet Home mine.....	In concretions.
Anglesite.....	Horseshoe lead-mine.....	Crystallized.
Chalcanthite....	Sweet Home mine.....	In concretions.
Calcite.....	Very abundant in all of the mining districts.	Crystallized and massive. Some of the crystals are double-refracting.
Dolomite.....	In limestone.....	Massive.
Siderite.....	Sweet Home mine and many places in Park.	Crystallized.
Cerussite.....	In Horseshoe mines in immense masses, usually containing a kernel of galena. Assays from \$10 to \$200 in silver. No gold.	Massive. Very abundant.
Malachite.....	Sweet Home mine.....	In very minute crystals and concretions.

Peru district, in this county, has furnished some magnificent specimens of ruby silver, in large and translucent crystals. I cannot give the precise locality.

Previous condition of mining affairs in Park County.—From 1859 to the present time, placer and lode mining have been conducted in Park County with greater or less success. It is impossible to form any correct estimate of the total production in gold for that time, but it will probably fall short of \$2,750,000.

The placers have been mined principally by the slow and expensive method of rocking and ground sluicing. Within the last two years more economical processes have been introduced, and gravel which a few years ago would not pay over \$2 a day to the man, will now yield \$5 to \$10, and even \$20.

This increase in production and corresponding diminution in expense has been effected by substituting water-power for manual labor. During the past summer several parties have introduced the system of booming. This consists in collecting water in a reservoir until a strong head is obtained, and then letting it over the bank to be washed, in a body. The powerful current carries down trees, boulders, and all other impediments, and moves more dirt in a single hour than could formerly be excavated in a day.

The history of the gold-lodes of this district is exactly the same as that of Central, Gold Dirt, Empire, and many other mining camps in this Territory. The top quartz, decomposed and prepared by nature for amalgamation, was easily mined and readily treated. Large companies were formed, extensive mills built, and much money expended. As soon as the sulphurets were reached, the mills were closed and operations on the mines suspended, as it was found impossible to treat the pyritous ores successfully by amalgamation. There are a large number of gold-leads at Hamilton, Montgomery, and Mosquito, which only require proper treatment to render them profitable. Concentration and smelting would appear to be the most effectual and economical method of handling these ores.

Present condition of mining affairs.—Mining has received a powerful impulse during the past year from the rich silver discoveries on Lincoln and Bross Mountains. Although no great amount of money has as yet been taken out, the discoveries have caused an influx of prospectors and capitalists, and called attention to the wonderful riches of the whole Mosquito range from Ute Pass to Buffalo Peaks. The summer of 1872 was unusually cold and stormy, but in the face of these drawbacks, and in spite of the fact that nine men out of ten were prospecting and not mining, the South Park mines have produced about 1,500 tons of ore, which has been sold for about \$150,000. I estimate the cost of mining and transporting this ore at \$70,000, leaving a net profit of \$80,000 for the working season of four months. This ore has been principally purchased by a branch of the Boston and Colorado Smelting Company, and by the Mount Lincoln Smelting-Works. The latter works have been in successful operation since December 1 of this year, are purchasing for cash all ores offered, and smelting daily about 10 tons. They use a blast furnace 3 by 3½ feet in size and 12 feet high. The furnace has three tuyeres, and the blast is furnished by a Sturtevant's, No. 7, pressure blower. The products are lead riches and copper matte, all of which are shipped to Germany for further treatment. The prices paid for ore are liberal, being from \$20 to \$50 higher than can be realized by shipping to St. Louis or Swansea.

The silver discoveries on Lincoln and Bross this summer have been

very numerous. They are without doubt superficial deposits in limestone, but appear remarkably regular and well-defined and very extensive. I cannot learn that any deposits *in situ* have "played out," although there are reports to that effect from discouraged miners. Many prospectors have discovered and recorded little stray bunches of mineral which occur frequently in the slide, and, of course, have dug them out. These little pockets can almost invariably be traced to the main deposit above, and there is no doubt that they have simply been broken off and moved down the hill by some convulsion of nature.

A very large number of silver-mines have been discovered on the south slope of Buckskin Mountain. I append a list of the names, owners, size, amount of development, and assays of some of the most promising of these leads, in order to call attention to the value of this hitherto neglected district. Besides those mentioned there are a multitude of lower grade, and from the surface-indications I judge that hundreds more will yet be discovered. The material that they contain is of such a nature as to admit of easy concentration, and I am satisfied that dressing-works would find steady and profitable employment in this district.

Future prospect of mining affairs.—The year 1873 will show an enormous increase in the production of the South Park mines. Most of the men who were prospecting last summer will commence developing their property and become producers. The time that was spent the past season in building houses, grading trails and roads, and opening mines, will be employed in taking out ore.

The Park Pool Company are working the Hiawatha and Beeger this winter, and will employ a large force of men on their various mines as soon as the spring opens. Messrs. J. H. Dudley & Co. have nine men on the Moose, and next season will employ some fifty or sixty more on their other mines. Many other operators have announced their intention of mining on Lincoln and Bross, and also extending their operations to Hamilton, Montgomery, Buckskin, Mosquito, and Horseshoe. It is also probable that large smelting-works will be erected in the latter district, to reduce the argentiferous lead-ores that are found there in great abundance. It is probable that the production of 1873 will exceed \$1,000,000. It is confidently expected that a railroad will be built into the park during the coming year. This would give an additional impulse to mining. It would not only greatly lessen the cost of mining supplies, and afford cheap transportation for the rich ores and products of the smelting-works, but it would put the mines in direct communication with the coal-fields and beds of iron-ore near the base of the mountains. This would give cheap fuel and cheap flux for the smelters, and by lessening the cost of reduction would greatly increase the value of the ore. The coal-bed now worked near Hamilton, Park County, although large and regular, furnishes a quality of coal entirely unsuited for smelting. It is a middling good quality of lignite, will not coke, and is unable to bear the burden which it would be obliged to carry in a high furnace.

The owners are of the opinion that the coal will improve greatly in quality as depth is gained. I sincerely hope that such may be the case.

The Phillips mine.—This mine, being one of the most important and valuable gold lodes of this district, I insert a short sketch of its discovery, production, extent, &c. I do this to show the characteristics of the gold lodes found here in the lower strata of sandstone. The mine was discovered in Buckskin Gulch in 1860, by Joseph Higginbotham, alias "Buckskin Joe." In June, 1861, twelve persons were working on it. In September of the same year the town of Buckskin contained 1,000

inhabitants. From June 18 to October 19, Stansell, Bond & Harris, who owned 200 feet of this lead, took out \$50,000. The process they employed was very simple. The top quartz and dirt was run through sluices, and the headings were re-worked in arrastras, yielding \$350 per cord. The retorted gold sold for \$16 per ounce, coin. During the same season about \$25,000 was taken out by other parties. The lode was worked until 1863, when sulphurets were reached, which could not be treated by ordinary mill process. The total yield of the lode has been about \$250,000, although many claim it to have been much greater. The average width of the Phillips is 30 feet, and it has been worked for a length of 2,000 feet. It traverses a quartzite formation, has a gangue of quartz and heavy spar, and carries immense masses of iron pyrites, traversed by small and irregular veins of copper pyrites and zincblende.

The lode descends perpendicularly for 25 feet, and then splits up and pitches east almost horizontally in a multitude of seams varying from 1 inch to 10 feet in thickness. Thousands of tons of auriferous sulphurets are still exposed to view, and will doubtless be utilized at some future day.

The Moose.—This representative silver mine of the newly-discovered limestone district was discovered in July, 1871, by Captain Plummer. The "Dwight," probably an extension of the same, was discovered in June, 1869, by Plummer & Myers. In 1871 this property was sold to Dudley & Co., who took out the same season from the Moose 30 tons, yielding 300 ounces per ton; from the Dwight, 15 tons, yielding 275 ounces per ton. As this material was shipped to Swansea exactly as it was taken from the mine, without any sorting or other preparation, the yield is very remarkable. The Moose has been traced for 800 feet and opened for nearly 400 feet. The crevice varies in width from 8 inches to 6½ feet, and pitches into the mountain at an angle of 35°. The country rock is black limestone, and the gangue of the vein is principally heavy spar. The principal silver-bearing minerals are galena and various decompositions of copper pyrites; much carbonate of lead is also found. The ore requires no sorting and is easily smelted. During the summer of 1872, 300 tons of this ore were sold to the Mount Lincoln Smelting-Works, yielding \$350 per ton. A very small force of men has been employed upon the mine, and all the ore from it has been packed to timber line upon jacks. The elevation of the mine above sea-level is something over 13,000 feet.

Placer-mines.—There is an immense area of gravel-deposits in the South Park, which, owing to the high price of labor and imperfect methods of working, has never yet been touched. From personal observation and careful compilation of the statements of our most experienced gulch-miners, I estimate that there are no less than fifteen square miles of placer-ground which will yield \$8 per day to the man by an extensive and economical method of working.

In the immediate vicinity of Fair Play, and since the founding of that town, about \$1,000,000 worth of gulch-gold has been taken out, at an expense of \$500,000. This gold is worth on an average \$18.50 per ounce, coin. The following analysis, made by myself, will show the nature of the alloy:

Gold.....	89.42
Silver.....	9.92
Copper.....	Trace.
	99.34
Specific gravity.....	15.11

In the neighborhood of Hamilton and Tarryall, placer mining has been prosecuted since August, 1859, and has yielded about \$1,000,000. There are still some 2,000 acres of gravel left, which will yield from \$5 to \$12 per day to the man. This gold comes principally from the lodes above Hamilton, which are numerous and large, but cannot be worked profitably by ordinary mill process.

The Bank mine of Messrs. Mills and Hodges, on the Platte, about four miles above Fair Play, has been worked for three years. In that time 2,000 days' labor have been expended upon the mine at an expense of \$3 per day. Forty-five thousand cubic yards of gravel have been washed, yielding \$19,350, or 43 cents per cubic yard. Average work per day per man has been $22\frac{1}{2}$ yards, producing \$9.67 $\frac{1}{2}$. Their ditch is three miles long, 6 feet wide at the top and 4 feet at the bottom, with a quarter of an inch fall to the rod. It carries about 900 inches of water. The mine is only run during the day, and the proprietors have sold sufficient water at night to meet all incidental expenses of the mine. They use a hydraulic pipe with a 70-foot head and an inch and a quarter nozzle, and have a 2-foot flume, 220 feet long, paved with block ripples. They intend next summer to construct a 5-foot flume and use the booming method. Their average depth of gravel is 21 feet, and is increasing rapidly. The ground pays more or less from the grass-roots, but the principal money is found on a stratum of "hard-pan" 5 feet above bed-rock. The gold is mostly in the shape of shot, and sells for \$18 per ounce.

Messrs. Pease and Freeman have been working a gulch-mine on Beaver Creek, about one mile from Fair Play, for eight years. The first year they worked five men and took out 58 cents. Since then they have expended \$20,000 in running a flume 2 feet wide and three-fourths of a mile long, and have opened up an inexhaustible area of half-ounce diggings. Their supply of water is small, but sufficient to carry all boulders through their flume.

Messrs. J. W. Smith and Fred. Clarke have purchased nearly all the claims on the Platte River about two miles above and below the town of Fair Play. They have bought out some thirty-six men, and are running a flume 6 feet high and 6 feet wide, with a grade of 2 inches to 12 feet. The season of 1872 was spent in preliminaries, but there is no doubt that in future the enterprise will be self-sustaining until bed-rock is reached, when very large pay is expected, as the dirt has yielded as high as \$41 a day to the man, by shoveling into sluices. The owners will have to flume for about one mile before striking bed-rock.

LAKE COUNTY.

The placer and lode mines of California Gulch have been worked vigorously this summer. The Printer Boy, owned by the Boston and Philadelphia Gold-Mining Company, J. Marshall Paul, agent, and by Captain Breese, has a crevice from 12 to 17 feet in width. I am informed that the whole of this enormous vein yields under stamps at the rate of 17 ounces per cord, or \$45 per ton. The mine is, however, very pockety, and sometimes incredibly rich bunches of mineral occur. I am informed by one of the proprietors that a panful of dirt has been taken from one of these pockets which yielded 132 ounces in gold. The mine has a shaft on it 140 feet in depth, with levels run at regular intervals, and a large amount of backs yet untouched.

The Beery Tunnel, owned by Captain Breese, has a large crevice,

and assays well in gold, silver, and copper, but the ore cannot be treated advantageously by the common mill process.

The "Five-Twenty" has a 7-foot crevice, with a pay-streak 14 inches wide, which yields \$20 per ton.

There are a great number more of these gold-lodes, which only require development and means of reduction to make them valuable. They are all situated in quartzite, dipping west.

The total yield of the placers in this gulch has been estimated at \$3,000,000, and there are still some five square miles of gravel-deposits which will pay \$5 per day.

The Homestake mine, near Tennessee Pass, has been extensively worked this summer by Mr. McFadden. This vein has been traced for about 3,000 feet, and has an average width of 16 inches. The mineral is principally galena, with some copper and iron pyrites. About 50 tons have been sold this summer, yielding \$125 per ton.

In Iowa Gulch, Breese, Paul & Co. are constructing a ditch, fourteen miles in length and 6 feet wide, to convey water to these very rich diggings.

The gulch is four miles long and 40 to 150 feet wide, with an average grade of $3\frac{1}{2}$ inches to 12 feet. The depth to bed-rock is about 12 feet, and the whole gulch is rated as twelve-ounce diggings.

LODES RECORDED IN PARK COUNTY IN 1872.

Consolidated Montgomery mining-district.—Our Fritz, Red Bird, Black Bird, Tar Heels, Pioneer Silver Lode, Summit County, Terrible, Comoro, Sheridan, Eyrie, Ohio, Bellvue, Pack Saddle, Belmont, Legal Tender, Moreno, Cricket, Queen, Wolverine, Highlander, Alma, Booth, Jupiter, Oro Cash, Dolly Varden, Arctic, Ajax, Old Abe, Hoosier Boy, Caribou, Ocean Wave, Crown Point, Mammoth, Von Bismarck, Silver Wave, Cayuga, Confidential, Cora, White Fawn, Alma Extension, Blue Jay, Peacock, Reindeer, Rough and Ready, Olive, Denver City, Combination, Gertrude, Park County, Montezuma, Swansea, Terror, De Soto, North Star, Ledge, C. S., Dolly Varden, Kansas, Collins, Red Rock, American Flag, Cavern, Hamilton, Newton, Australia, Baltic, Miners' Delight, Mascou No. 1, Mascou No. 2, Russia, Seven-Thirty, Waterloo, Hidden Treasure, Bullion, Revenue, Fortune, Esta Buena, Colorado, Prolific, Buckeye, Autocrat, Castello, Concordia, Phoenix, Glancorie, Longfellow, Eclipse, Chicago, Milwaukee, Marco, Phil Sheridan, Minnehaha, Ferguson, Kohinoor, Leonora, Big Emma, Peacock, Queen of the May, Horace Greeley, Isabella, General D. H. Hill, Big Sunflower, Zeb. Vance, Buckeye No. 1, Buckeye No. 2, Juniata, Maggie, Cosmopolitan, McNab, Park County, Elgin, Grant, Monday, Hughes, Wheal Cate.

Buckskin Joe district.—Queen, Globe, Rising Sun, Three Men, Big Horn, Dolly Varden, School Marm, Guinea, D.D., Rocky Point, Bunker Hill, Framingham, P. D., Snow Bird, Johnny D., Whopper, Sneezeweed, Grant, Aztec, Pawnee, Stranger, Antelope, Home State, Fourth of July, Buckeye, Buffalo Head, Emma, Buckskin Joe, Flood Tide, Mattie Mullen, Taylor, Overseer, Homestead, Knox, Little Ettie, Pioneer, Jackson, Uncle Charley, Red Cloud, Park County, Tiger, Indian Boy, Ruby, Ipswich, Augustine, Compton, Monte Christo, Narrow Gauge, Sailor Boy, Potosi, Emma Louisa, Uncle Sam, Mountain Gem, C. H. Rodgers, Manganese, Condor, Thanksgiving, Lead, High Grade, Absecome, State of Maine, Kenduskey, T. D. Hume, Dick Lord, Bull Dog, Red Cloud, Wade Hampton, McGraw, Confidence, Columbia, Hanging, Rubicon,

Rubicon Extension, Angola, Raven, Lofty, Greenback, Security, Bagdad, Liberal, Idaho, Mahone, Ground Hog, St. Elmo, Quaker, Trail, New Discovery, Red Mountain, Norumbega, Black Bird, Rheinlander, Green Bird, Careless Boy, New Castle, C. D., A. B.

Mosquito district.—Whale, White Horse, State of Maine, Champion, Unknown, Black Bear, Humboldt, Colorado, Great Western, Morning Star, Porphyry, Clinton, Topeka, Hard to Beat, Elephant, Larke, J. B. Chaffer, Ballarat, Cora.

Hall's Gulch.—Wallace, Densmore, Nichols, Athens, Brownell, Liftwick, Comet, Ulster County, Cold Spring, Marietta, Dolly Varden, Baby, Cliff, Alice Cary, Olive Hoyle, Elizabeth, Columbus, Elliot, Colorado, Bison, Jasper.

Gibson Gulch.—Fat Boy, Orphan Boy, Hubbard, Yankee Boy, Yankee Nation.

Pennsylvania Gulch.—Julia.

Swan Gulch.—Summit.

Putnam Gulch.—Old North State, Barney.

Horseshoe district.—Buckeye State, Brownlow, Maria De Los Rayes, Blue Jacket, Elizabeth, Fair Play, Spar, Treasury, Galena, Brownlow Extension, Spotted Hornet, Sedgewick, Crystal Fountain.

Geneva district.—Starr, Perry, Hunt, Snow Storm, Dolly Varden, Black Dan.

Tarryall district.—O K, Silver Mist, Republic.

Outside of districts.—Santa Fé, Colorado, Tender Foot, Patebuma, Lion, Sunny Side, Tiger, Bonnie Doon, Millionaire, Metz, Orphan Boy, Tempest, Sherman Nos. 1, 2, 3, and 4, Manhattan, Chase.

List of principal mines in Buckskin district.

Name.	Owner.	Depth.	Width of crevice.	Assay value per ton.
Narrow Gauge.....	Mullen & Jordan.....	10-foot shaft.....	6 inches.....	\$450 00
Monte Christo.....	do.....	12-foot shaft.....	3 feet.....	82 60
Careless Boy.....	do.....	30-foot tunnel.....	15 inches.....	700 00
Sailor Boy.....	do.....	30-foot tunnel.....	1 foot.....	390 00
Buckskin.....	do.....	15-foot shaft.....	3 feet.....	175 00
Great West.....	do.....	2 25-foot shafts.....	4 feet.....	*60 60
Capital.....	do.....	8-foot shaft.....	10 inches.....	100 00
Union No. 4.....	A. Bergh.....	120-foot shaft.....	18 inches.....	117 17
Surprise.....	T. Jordan.....	10-foot shaft.....	3 feet.....	101 01
Old Money Bags.....	do.....	14-foot shaft.....	3 feet.....	190 90
Homestead.....	Mr. Simms.....	10-foot shaft.....	2 feet.....	112 00
Winnebago.....	do.....	10-foot shaft.....	1 foot.....	200 00
Mineral Bluff.....	do.....	14-foot shaft.....	6 inches.....	90 00
Knox.....	Dunbar & Rische.....	10-foot shaft.....	8 inches.....	360 00
Little Ettie.....	do.....	12-foot shaft.....	10 inches.....	340 00
Von Moltke.....	do.....	10-foot shaft.....	8 inches.....	117 00
Taylor.....	Mr. Taylor.....	12-foot shaft.....	6 inches.....	384 00
Raven.....	do.....	20-foot shaft.....	30 inches.....	130 00
Filthy Lucre.....	do.....	8-foot shaft.....	1 foot.....	75 00
High Grade.....	Dick Lord.....	10-foot shaft.....	3 feet.....	112 00
Norumbago.....	do.....	20-foot tunnel.....	10 inches.....	98 00
Summit Lake.....	Fritts & Harriden.....	15-foot shaft.....	18 inches.....	642 00
Confidence.....	McGraw & Hartwell.....	20-foot shaft.....	1 foot.....	725 00
McGraw.....	do.....	2 tunnels.....	9 feet.....	812 00
Stella Hartwell.....	do.....	10-foot shaft.....	5 inches.....	170 00
Sunday.....	do.....	12-foot shaft.....	6 inches.....	219 00
Silver Star.....	do.....	12-foot shaft.....	2 feet.....	125 00
Hope.....	do.....	8-foot shaft.....	2 feet.....	90 00
E. D. Peters.....	do.....	12-foot shaft.....	30 inches.....	302 00
Delavan.....	do.....	14-foot shaft.....	1 foot.....	211 00
Arctic.....	do.....	12-foot shaft.....	3 feet.....	128 00
Tom Thumb.....	do.....	10-foot shaft.....	4 inches.....	137 00
Irving A. Owens.....	do.....	10-foot shaft.....	3 inches.....	127 00
Little All Right.....	do.....	10-foot shaft.....	8 inches.....	95 00
Em. Brayton.....	do.....	10-foot shaft.....	3 feet.....	80 00
Green.....	do.....	8-foot shaft.....	5 feet.....	100 00

List of principal mines in Buckskin district—Continued.

Name.	Owner.	Depth.	Width of crevice.	Assay value per ton.
Victor	McGraw & Hartwell	10-foot shaft	3 feet ..	\$60 00
Sweet Home	Morgan & Henderson	80-foot tunnel	18 inches	90 00
Red Mountain	Mills & Huges	40-foot tunnel	18 inches	80 00
Overseer	Jerry Newell	10-foot shaft	12 inches	200 00
Potosi	George Wells	30-foot tunnel	15 inches	400 00
D. D.	Douglass & Clarke	18 foot shaft	30 inches	150 00
Uncle Sam	Seymour & Peters	8-foot shaft	20 inches	150 00
Mountain Gem	do	10-foot shaft	18 inches	200 00
Wade Hampton	Burroughs, Helde & Co.	25-foot shaft	6 inches.	1,200 00
Fourth July	do	10-foot shaft	20 inches	175 00
Johnny Dee	do	10-foot shaft	10 inches	75 00
Whopper	Mahany & Co	8-foot shaft	30 inches	110 00
Legal Tender	Dudley & Co	60-foot tunnel	18 inches	50 00
Hamburg	Mr. Simms	10-foot shaft	10 inches	130 00
Pelican	Mr. Walker	12-foot shaft	2 inches.	700 00

* Gold.

THE CAÑON CITY COAL-BEDS.

The following account of these beds constitutes a paper by R. Neilson Clark, M. E., read at the Pittsburgh meeting of the American Institute of Mining Engineers, and courteously placed at my disposal by the author. Mr. Clark is the engineer in charge of the mines, and has thoroughly examined the whole field.

The coal-beds of Cañon City are situated six miles below the town upon the Arkansas River.

At this point the Rocky Mountains have thrown out from their main ridge two spurs. The one to the north, containing Pike's Peak and Cheyenne Mountain, is known as part of the "Rim Range;" the one to the west and south is known as the "Greenhorn Range."

Against these syenitic mountains the later rocks, from the silurian to the tertiary, are piled and uplifted; at right angles to the direction of this main uplift is the axis of a lesser plication.

On the north, west, and south the pitch is steep, gradually flattening as it approaches the center of the basin and rising again to the east at a pitch of about 5° , thus forming a perfect basin, the center of which is only two miles east of the base of the Greenhorn Range.

Over the center of this basin, and against the Greenhorn Range are situated the highest geological rocks of this region—the coal-bearing sandstones.

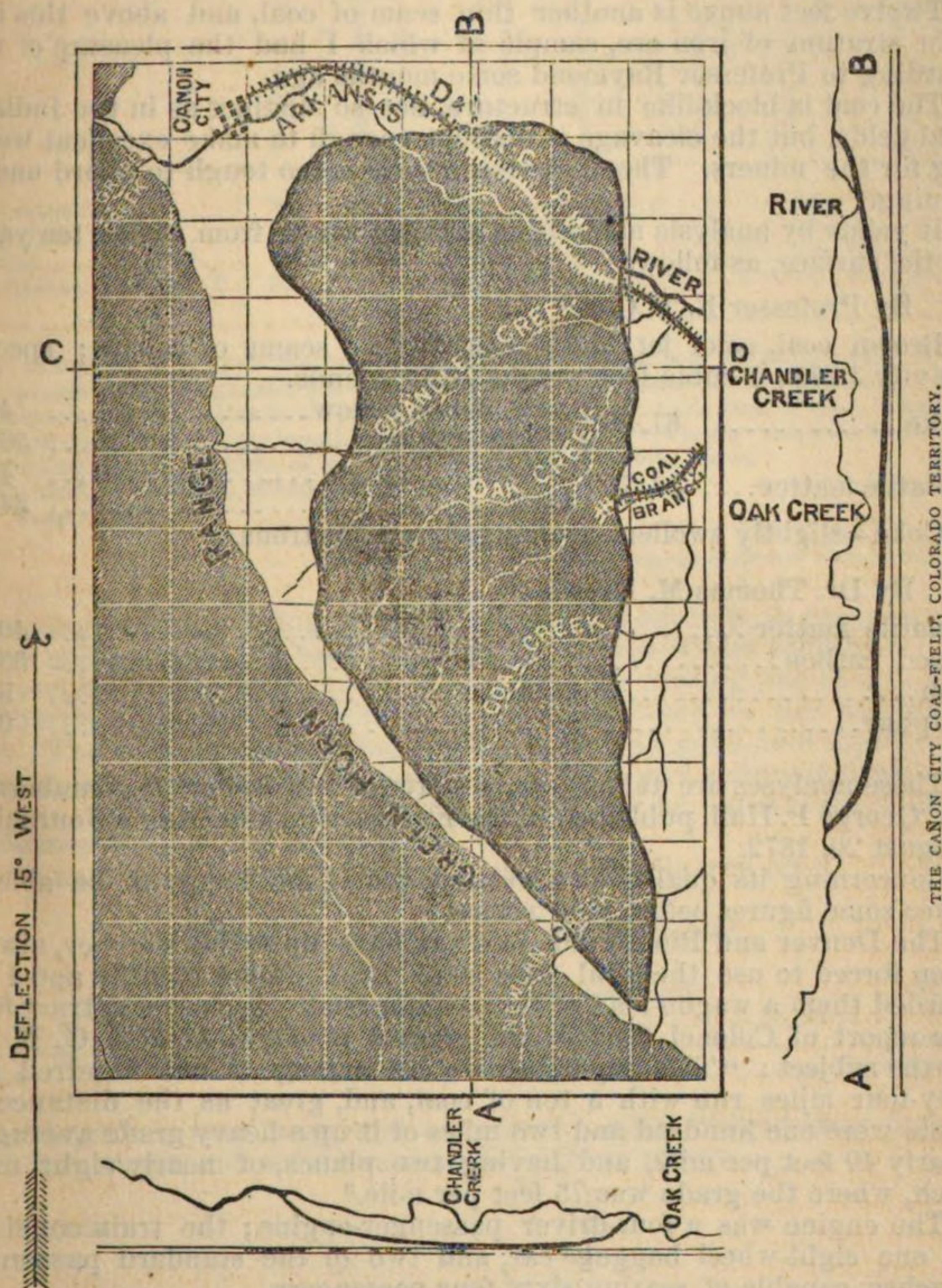
The bed is ten miles long at its greatest extent north and south, and five miles across at its greatest extent east and west; it contains in all about forty-four square miles of coal-bearing rocks.

A section through these rocks would give, from the bottom upwards, first, the sand-rock known for a hundred miles north of here as the "Hog-back"—probably eocene; on top of this a limestone; then the black shales; then the clay-bed—perhaps 200 feet in thickness; then the sand-rock—perhaps 150 feet thick—immediately underlying the coal.

To the north and east these seams are very thick, but they thin out to the west and south, the limestone and all intermediate strata disappearing, until at the south the bottom sand-rock lies upon the Greenhorn Range. The pitch at this point is not more than 15° , while but three miles to the north and west it is 60° to 80° , and stands apart from

the range. Still further to the northwest, the other strata begin to appear; the clay-bed, however, I have never found on the western edge.

The coal-yielding rocks are about 600 feet in thickness—they are sand-rocks, with some black, yellow, and red shales.



THE CAÑON CITY COAL-FIELD, COLORADO TERRITORY.

There are very few of our characteristic bituminous shales so common in the carboniferous measure. The shales and slates contain but few fossils; the sand-rocks are full of the leaves of the oak, the poplar, (?) and the calamopsis. These rocks contain at least nine seams—varying from 6 feet to 8 feet in thickness. They are thickest at the south end of the basin, gradually thinning out to the north as the intermediate rocks thicken, thus two seams at the south, close to the range, are respectively 6 and 7 feet thick, and but 50 feet apart; at

the north, on the river, they are but 2 and 4 feet thick and at least 150 feet apart.

The lowest of all of these seams is known as the Cañon City coal. Its section gives, from the bottom up, first, sand-rock; secondly, shale; thirdly, coal 8 feet; fourthly, shale and clay 24 feet; fifthly, coal 51 feet; sixthly, brown shale 8 feet; seventhly, coal 13 feet.

Twelve feet above is another thin seam of coal, and above this is a thin stratum of iron-ore, sample of which I had the pleasure of forwarding to Professor Raymond some months ago.

The coal is block-like in structure, not so distinct as in the Indiana coal-fields, but the cleavage is distinct enough to make excellent working for the miners. The underlying clay is too tough to afford undermining.

It yields by analysis made from samples taken from within ten yards of the surface, as follows:

By Professor E. T. Cox:*

Brown coal, color jet black, contains no seams of calcite; specific gravity 1.279; 1 cubic foot weighs 79.63 pounds.

Coke	61.30	{	Ash, ocher yellow.....	4.50
			Fixed carbon.....	56.80
Volatile matter....	38.70	{	Water	4.50
			Gas.....	34.20

Coke—slightly swollen, unchanged, semi-lustrous.

By Dr. Thomas M. Drown:

Volatile matter	40.65
Fixed carbon.....	53.69
Ash.....	5.66
Sulphur.....	0.59

These analyses are taken from a letter of Mr. Robert H. Lamborn to Mr. George P. Hall, published in the Engineering and Mining Journal, of August 20, 1872.

Concerning its quality as a working-coal, I am happy to be able to place some figures before your notice.

The Denver and Rio Grande Railway have, up to this summer, always been forced to use the coal from near Erie. Some months ago I forwarded them a wagon-load of this coal for trial. I give an extract from the report of Colonel Greenwood, general manager D. & R. G. R. W., on the subject: "This report shows an average of one hundred and fifty-four miles run with a ton of coal, and, great as the distance is, there were one hundred and two miles of it up a heavy grade averaging nearly 40 feet per mile, and having two planes, of nearly eight miles each, where the grade was 75 feet per mile."

The engine was a four-driver passenger-engine; the train consisted of one eight-wheel baggage-car, and two of the standard passenger-coaches, capable of seating sixty-four passengers.

In the stove it burns very rapidly, with but very little smoke and no smut.

I forwarded specimens of this seam and the 4-foot overlying one, known as the "river-seam" to the Denver gas-works.

Mr. Fay, the superintendent, has been kind enough to send me the result of their experiments. I copy *verbatim*:

* Concerning the analyses of these western coals, see a subsequent chapter on "The Calorific Value of Western Lignites."—R. W. R.

Result of tests (for gas alone) of coal from the Arkansas River and other districts, August 12, 1872.

Locality.	Weight in ounces.	Time in retort.	Coke.	Residue in retort.	Cubic feet crude gas.	Cubic feet washed gas.	Illuminating power.
River seam	32	25	None..	18 oz. S. P..	18	8.6	Fair.
Cañon coal	32	25	...do...	18 oz. S. P..	17	7.6	Poor.
Trinidad	32	25	...do...	17 oz. L. P..	19	9.2	Good.
Rock Spring, Wyoming T.	32	26	...do...	18 oz. L. P..	15.6	7.2	Very good.

The letters S. P. (small pieces) denote that the residue is of no further use; L. P. (large pieces) that the greater portion of the residue will burn in our furnaces.

Carbonic acid and carbonic oxide in considerable force in each kind of coal. Sulphur present in each, but in very small quantity, the least in River seam; have no means of determining the proportions of either of the above obnoxious gases.

Each kind of coal was tested three times.

Respectfully,

WM. J. FAY,
Superintendent Denver Gas-Works.

Openings are now being made of the eastern outcrop, in preparation for the shipment of 150 tons per diem during the winter months.

Experiments are soon to be commenced for testing the coal in the blast furnace, as large deposits of iron-ore are found in the neighborhood. The demand for iron hereabouts is already good, and rapidly increasing, and it is hoped that the blast furnace and rolling mill will be lucrative investments. The amount of rails to be rolled is enormous; the nearest mills are at Saint Louis.

As it may be of interest, I add an analysis of the iron ore:

"Grape Creek iron-ore," Fremont County.

Silica.....	2.75	Oxide of magnesia.....	trace.
Mag. ox. of iron.....	67.76	Magnesia.....	3.20
Titanic iron.....	18.98	Sulphuric acid.....	trace.
Alumina.....	9.70	Phosphoric acid.....	faint trace.

The deposit is very large, and only twelve miles distant large deposits of iron-stones abound; limestone is in great plenty.

CHAPTER VIII.

WYOMING.

No new mining-districts have acquired prominence in this Territory during the year, and there is little to report of the old ones.

Mr. R. K. Morrison, of Miners' Delight, has kindly furnished data in regard to the gold mines of the Sweet-water region. From his report, I estimate that, although not many quartz-mines have been in steady operation, the vigorous working of the placer-mines during the summer has fully made up the loss in production from the former source, and \$100,000 coin may be safely accepted as the gold product of the region for 1872.

The close proximity of Utah, with its numerous deposits of rich silver ore, together with the universal habit of miners to stampede to every newly-discovered district of note, have almost depopulated the gold regions of Wyoming.

South Pass City is nearly deserted, all of the numerous ledges surrounding it now lying idle. The celebrated Cariso mine, from which so much bullion was taken in 1869 and 1870, was disposed of by Mr. Roberts in the fall of 1870. The English company, owners of the Irishman ledge, became the purchaser, paying \$15,000 down, and agreeing to pay \$115,000 more in monthly installments. After being put in possession of the mine, it was ascertained that they were not only unable to pay for the mine, but also to work it. They had evidently bought it on speculation, hoping their stock could be sold on the record of the Cariso. Since that time nothing has been done on the mine.

The Young America is also idle, the company having become disheartened by the loss of their valuable mill. The mine is well opened, exhibits a vein averaging 2 feet in width, and yields, by ordinary stamp process, about \$15 per ton.

The other mines in this vicinity are similarly situated. They are all idle, and their locators are absent in Utah, prospecting for silver and lead mines.

Atlantic City presents a more prosperous appearance than South Pass, although but two mines are in operation there.

The Cariboo mine, formerly owned by Messrs. Cutler & Houghtaling, of Chicago, and operated by them one short season only, was subsequently abandoned. But upon the passage of the new United States mining law, regarding relocations of abandoned mines, it was relocated by a party of miners, who, since that time, have taken out a large quantity of ore, which yields from \$10 to \$30 per ton. There is no machinery upon this mine, the ore having to be hoisted by windlass. The relocators are well satisfied with their venture, and are still hard at work.

The Buckeye mine has been in continual operation ever since its location in 1868; and although started without machinery, capital, or credit, it has steadily progressed through misfortunes, cap-rock, non-paying quartz, &c., until it has accumulated enough to procure good hoisting works, a 10-stamp mill, a 6-inch double-acting pump, and a good credit. Finding the pump insufficient to drain the mine, they were forced to sink a new shaft, started at a less elevation than the old one. At the bottom of this new shaft they have a 10-foot vein of quartz, yielding on an average \$9 per ton. Cost of mining and milling about \$6.

Miners' Delight, or Hamilton City, is in a more prosperous condition than either of the two last-mentioned camps. In fact, no diminution of its population is discernable.

The old Miners' Delight mill has been idle during the past year for most of the time, but at present a force of men are taking quartz from the mine, which, it is estimated, will yield \$20 per ton.

The Hartley mine, the west extension of the Miners' Delight, has been improved during the past year by the erection of a fine 20-stamp mill and hoisting works. A test run was made before the erection of the mill of 30 tons, yielding \$30 per ton.

The East End Miners' Delight, consisting of 800 feet, owned by R. W. Shawhan, of Tiffin, Ohio, has also been improved by the erection of a fine 20-stamp mill and hoisting works, with 6-inch cornish pump, all run by one 40-horse-power engine. This mine is now in full operation, and shows a quartz vein of from 2 to 5 feet in width. The rock yields from \$8 to \$15 per ton. Cost of mining and milling, superintendent's salary included, \$6 per ton.

The gulch mines were vigorously worked during 1872, giving employment to about one hundred men, and yielding upon an average \$8 per day to the man. Cost of wood, delivered, \$3.50 per cord; miners' wages, \$4 per day; mechanics, \$5 per day.

The above shows that the amount of development so far is not large, yet it must be remembered that this region has had no benefit of working capital, each mine being dependent upon its yield for its subsequent development.

THE COAL MINES.

Of the two principal coal-mining companies of Wyoming, I submit the following statement, kindly furnished by the respective superintendents, Messrs. Charles J. Denel and Thomas Wardell:

Statement of mining operations of the Rocky Mountain Coal and Iron Company for 1872.

Coal mined in:	
January	8,481
February	7,597
March	8,857
April	8,106
May	7,351
June	7,204
July	8,657
August	9,066
September	8,420
October	8,237
November	9,228
December	13,856
Total for 1872	105,060

This company would have mined much more in September, October, and November, 1872, if they could have had cars enough. The railroad companies were both short of transportation. The company mined in January, 1873, 13,300 tons.

At the end of the year No. 1 slope was 563 feet long; No. 2 slope 630 feet long; No. 3 slope 472 feet long. No. 1 mine was working 3 levels; No. 2 mine was working 5 levels; No. 3 mine was working 6 levels. There are worked at No. 1 mine 2 dumps; at No. 2 mine 2 dumps; at No. 3 mine 1 dump.

Three sets of hoisting-works, employing double engines at two and single engine at one mine, are in use. There are, furthermore, 3 engine-houses, 3 blacksmith-shops, 3 weigh-houses, 3 sets of scales, snow-sheds, &c.; 64 dwelling-houses, 1 manufacturing-shop, 1 carpenter-shop, 1 school and meeting-house, 1 store, 1 hotel, 1 butcher-shop and market, 1 office, 1 car-shop, 1 stable, corral, wagon-house, ice-house, &c.

The company's track is four miles long from the main line of Union Pacific Railroad to the mine, including side-tracks, spurs, and switches.

Three furnaces are used for ventilation. There are also 3 wooden chimneys used for the same purpose.

The company employs 225 Chinese miners and laborers; 40 white miners; 25 white foremen and laborers; 15 white engineers and mechanics—total, 305.

Statement of coal shipped by Wyoming Coal and Mining Company during the year 1872.

Months.	Where shipped from.					
	Carbon.		Rock Spring.		Evanston.	
	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.
January	2,778	700	3,387	1,500	2,069	200
February	1,507	1,900	1,495	100	1,724	1,900
March	2,172	200	2,464	400	2,222	1,600
April	4,565	1,500	1,777	1,900	2,290	100
May	6,371	1,400	1,451	900	3,270	1,950
June	6,114	1,300	2,206	1,700	1,858	1,200
July	6,414	1,200	2,814	400	754	400
August	6,453	1,900	2,839	1,600	1,726	450
September	4,840	1,900	2,742	500	1,385	1,400
October	5,783	.....	3,779	700	3,065	1,400
November	5,946	1,800	3,737	.....	1,198	400
December	6,307	1,300	5,941	1,600	1,206	1,800
Total	59,257	1,100	34,637	1,300	22,773	800

CHAPTER IX.

NEW MEXICO.

This Territory has maintained the production of former years, but there is no material improvement to be reported.

At the Moreno mines the enterprise of the Moreno Valley and Gold-Mining Company, mentioned in my last report by Mr. Bloomfield, *i. e.*, the use of steam machinery for the raising and washing of auriferous gravel, has been carried out. The necessary arrangements were concluded in June, and a trial of a week's duration is reported to have given general satisfaction, the clean-up having been about \$800 of gold, .881 fine. It is worth nearly \$20 per ounce.

The works are placed opposite Spanish Bar, and consist principally of a tramway about 200 feet long and 35 feet high, carrying a track 3 feet wide. The upper end of the tram-way terminates in a platform which can be overrun by a stream of water, and which slopes gently down into a set of sluices. Cars, holding about 40 cubic feet, after being filled in the pit, are pulled up this track by a stationary engine placed on the ground, and are then emptied on the platform. There are also a number of flumes from different directions, conducting water at the proper heights to fill the sluices and work the pumps.

Mr. M. Bloomfield, the originator and manager of the enterprise, furnishes the following particulars of the trial-run: The number of men employed to fill each car was four; number of yards of dirt shoveled by each man per day averaged $15\frac{1}{2}$; number of trips made with two cars, 142 in ten hours. Work was carried on twenty hours out of twenty-four. Two men were required to dump the cars on the platform and to regulate the flow of the dirt into the sluices. The engine, a 12-horsepower, worked with 20 pounds of steam, apparently with ease. The weight of the load, including the weight of the car, is about 6,000 pounds. The height of the car is 42 inches from top of track to top of bed. One car was used from Saturday to noon on Tuesday. Another car was then added, but broke down twice during the week, causing a stoppage of eighteen hours. Excepting the breakage of a car, everything worked smoothly and regularly. The result of the run was a trifle over 50 cents for every cubic yard of dirt worked; judging from the number of men employed during the time, the expenses must have been considerably under the amount produced. After this trial, the company had three cars running day and night. They were in good ground, and though annoyed by imperfect drainage of their claim, they expected to reap a substantial benefit from their undertaking.

I have no later news from the mines than July, with the exception of the general estimate of the production of the district, which is given by my correspondent, together with the amount produced by the placers near Santa Fé, as about \$100,000.

Despite the many obstacles against it, the progress of Grant County has been quite rapid; mining-camps are springing up in every direction, and population is gradually increasing. Silver City, the county-seat, is the center of present mining operations. The town is beautifully situated in a charming little valley, flanked on both sides by rolling hills filled with precious metals and covered with timber and grass. It has a population of about one thousand, consisting chiefly of miners and their families, although most of the trades and professions

are well represented. Some of the buildings of Silver City will compare favorably with those of large towns in the East. Brick is being extensively manufactured, and that material will be used almost exclusively for building purposes in the future.

The great advantage which Grant County possesses over every other mining country is its superb climate. No extremes of heat and cold are known here throughout the year.

A correspondent wrote to me from the district in June, 1872:

There are but four small mills in this district at the present time and two more are on the road. Three of the mills have been running to their utmost capacity almost constantly, but have not been able to meet the requirements of the district by one-fifth. As a consequence tons upon tons of rich ore are lying in all directions awaiting reduction, and the prosperity of the country is greatly retarded for the lack of sufficient means to develop its immense resources. The shipment of silver bullion from this point alone now averages about 5,000 ounces per week.

It has been satisfactorily proved that the whole country for a radius of two hundred miles is literally filled with mineral. Gold, silver, copper, iron, and lead abound in the greatest profusion, all awaiting capital and industry to bring to light the hidden treasure buried in this vast area of country. Below will be found a brief statement of the product of each of the mills at this place for the week ending June 22.

From this can be formed some idea of the richness of the ore in this locality, which is not surpassed in many other mining-districts on the continent.

Statement showing number of tons of ore worked and value of silver extracted during the week ending the 22d day of June, 1872, at Silver City, Grant County, New Mexico.

	Number of tons.	Mine.	How worked.					Remarks.	Refined silver.
			Arrastras.	Stamps.	Pans.	Barrels, wooden.	Ball pulverizer.		
W. H. Brennan.....	21	Seneca.....	.....	5	.....	8	.....	Engine from Pinos Altos...	\$2,422 00
Wilson, Wells & Co.....	5½	Dexter.....	2	.....	.....	4	.....	.....	532 60
Wisconsin Mining Co....	17	2 Ikes.....	.....	.....	2	.....	1	Pans, Hepburn & Peterson.	1,050 00
J. U. Stevens.....	9	2 Ikes.....	3	.....	.....	2	.....	Engine from Pinos Altos...	786 00
By amalgamation.....									4,790 60
Extracted by furnaces—blast from blacksmith-bellows.....									2,200 00
Result of week.....									6,990 60

At Silver City there have been in operation during most of the time two 5-stamp mills, and a Ball crusher of the same capacity. A Howland rotary battery is now running, and two 10-stamp mills are nearly completed.

At Lone Mountain a 5-stamp mill has been running since November, 1872. No roasting-furnaces have as yet been erected in the county, and as most of the ore mined comes under the head either of smelting or base milling ore, the yield has been far less than could have been the case if chloridizing-furnaces had been employed. Smelting on a small scale has been carried on by Mexicans, great numbers of whom are coming from Sonora and Chihuahua. The effect of this immigration has been to cheapen labor very much, the best class of Mexican labor commanding only \$1.50 per day; corresponding American labor costs \$3—both without board.

A boulder was recently found on the surface in Lone Mountain district, which weighs 220 pounds, and is estimated to be worth between \$1,000 and \$2,000. A similar one was found in the same locality about

two years ago, which weighed 11 pounds 4 ounces, and produced \$177.30 in silver. The average yield of Lone Mountain ore by arrastra process is \$150 per ton. Worked by stamps without wasting, its yield has been \$35 per ton only.

An extensive deposit of slate has been found in Chloride district, which contains silver in the form of chloride and in metallic leaves. The rock averages from \$25 to \$79 per ton. It is worked with profit. There are other rich deposits in the district, but they are all very irregular, the country-rock being an unstratified limestone.

At Pinos Altos, during a portion of the past year, the Pacific gold-mine and a few others have been worked with profit, though on a small scale. The placers have not been very productive on account of the drought.

The title to the famous Santa Rita copper-mines is still in dispute. Several notices of relocation have been placed on them during the past year, and there now appears little likelihood of a patent being granted soon to any of the present claimants.

After a careful comparison of the figures of the mill-men, and purchasers and shippers of bullion, Mr. M. J. Ryan, to whom I am indebted for facts in regard to Grant County, estimates the yield of gold and silver of that county during 1872 at \$350,000.

The Socorro silver-mines, situated in the Magdalena Mountains, about twenty-four miles from the town of Socorro and twenty from Limitar, have been worked to some extent, and a few experiments have been made to reduce the ores. The district, so far as it has been prospected, extends about twenty miles from north to south, and is about twelve miles in width, the ores being carbonate of lead, bearing silver at the rate of from \$30 to \$600 per ton, and sulphuret of copper, also rich in silver.

The most prominent carbonate-leads are the Poor Man's, Little Fanny, Grand Tower, Pony, Alpine, Washoe, Sucker, Wolverine, and Sterling.

Messrs. George Way & Co. have tried to reduce some ore from the Little Fanny in a small reverberatory. The result was 1,839½ pounds of lead, containing 66.7 ounces of silver. Much of the lead was lost in the slag. Another reverberatory furnace was erected by Messrs. J. D. Baker & Bro., but it could not be worked to advantage, and the same gentlemen built then a small cupola furnace, the blast of which was supplied from a bellows worked by hand. The result was satisfactory, in so far as more lead was extracted than in the reverberatory. Still, the capacity of the furnace being so small, and no machinery on hand, the furnace cannot be run to an advantage.

Some of the deposits above enumerated, and notably the Poor Man's and Little Fanny, are very extensive, measuring from 30 to 60 feet in width. They are rich in lead, but carry not much over \$30 per ton in silver.

The ores of the sub-district of Corona del Pueblo contain little lead, but they are richer in silver than those of the carbonate series of mines above spoken of. Assays so far made vary from \$25 to high up into the thousands per ton, and all ores carry some copper. The mines are as yet little developed.

CHAPTER X.

ARIZONA.

Mining interests generally look more hopeful in this Territory than at any time for the last ten years; and if the Apache question can be finally settled in favor of the miner, as it bids fair to be soon, the country will, by the time of the advent of the Southern Pacific Railroad, be in a forward state for a large and permanent production of the precious metals.

During the last year the yield of the Territory has fallen off considerably, principally on account of the troubles of the Vulture mine, but the activity in several new silver-districts promises to make up for this, as soon as the preparatory developments of the mines have progressed sufficiently. I estimate last year's product as follows:

Gold from Vulture mine	\$150,000
Gold from placer-mines and arrastras	300,000
Silver in bullion and ore-shipments	175,000
	625,000

I have again to thank Mr. John Wasson, surveyor-general of Arizona, for notes in regard to the mining industry of the Territory; and Messrs. T. J. Bidwell, of Yuma Country, W. F. Henning and W. H. Hardy, of Mojave County, have kindly furnished information in regard to their several districts.

The Planet mine, on Williams Fork, owned by the Planet Mining Company, and operated by the same, keeps about twenty men at work continually, and has shipped from 100 to 150 tons each month to San Francisco. The mine pays now, and has always paid. It carries copper-ore of a high grade.

The Constancia mine, about fifteen miles from Ehrenberg is owned and operated by the Constancia Mining Company, Charles Borger, superintendent. During the past year they erected a 10-stamp mill. They have three shafts in the mine, over 150 feet deep each, in which a ledge of about 4 feet in width is developed, paying from \$15 to \$25 per ton; at latest accounts about \$18 in gold. Cost of mining and milling, from \$6 to \$8 per ton. Work is going on now.

In Castle Dome district, Captain Polhamus & Co. are sinking on the Flora Temple mine. They are now down about 200 feet, and shipping about 50 tons of ore per month. They are mainly laboring to develop the actual worth of the mine, although the receipts from sales of ore defray expenses. The ore is argentiferous galena.

William P. Miller & Co. are operating on a mine near the Flora Temple on same kind of ore. They ship about 150 tons per month, and are making money, and work is going on now.

The Vulture mine, near Wickenburg, has been idle for over six months. Endeavors are being made to procure capital to take water to the mine, with what success I do not know. The product of the mine is about half that of former years, or about \$150,000. William P. Smith & Co. are putting up a 10-stamp mill on the Hassayampa, about fifteen miles below Wickenburg, and will soon commence crushing ore from their claims, which adjoin the Vulture Company's ground. They express great confidence of success. Mr. Peter Taylor, formerly mine-superintendent of the Vulture, is an interested party with Smith & Co.

in the present operations, and is convinced that their ground, as well as the Vulture, will pay well under proper management.

In Yavapai County no mills were put up in 1872, and I believe none but the Vulture ran at any time. Several arrastras have been kept going in Bradshaw district, and patents for eight mines therein, mainly on the Tiger lode, have been applied for. The placer-mines in Yavapai have been worked with average success in most of this district, and their yield is not less than in the previous year. In the extreme southeastern portion of Yavapai County a copper-district of great value has been discovered, and four surveys for patents to as many mines, and also one mill-site, have recently been made. A Detroit company stand ready to pay a large price for them and to commence work as soon as patents issue therefor.

In Pima County much prospecting has been done, and some new discoveries have been made. The necessary work is now being done to procure patents. Two mines have been patented, and more applications will soon be made. Returns have just been received of the working results of a lot of ore sent to San Francisco some months ago by Samuel Hughes, of Tucson; the ore coming from a mine located about thirty-five miles southwest of that town. The ore contains mainly copper, and purchasers offer for such ore \$200 per ton, laid down on the San Francisco wharf.

The Mowry mine is now being worked by some men who have put an engine thereon, and I understand with good results. The parties, being "jumpers," keep very still, waiting for the time to expire which is given by law of Congress to owners of mines to do the necessary work on their claims or forfeit them.

Ore from Pinal district, near Florence, (about 5 tons,) was sent to San Francisco last summer, and yielded about \$200 per ton. The parties were, however, driven away from the mines by Indians. They intended to commence work again soon, as they were certain of profits, judging from the 5 tons worked in San Francisco.

Wallapai or Hualpai district.—During the year 1871 little else was done by miners of this district than running over the hills and locating mines, and doing what work on each claim was necessary to hold it in accordance with the local laws of the district. Early in 1872 a 5-stamp mill (wet crushing) was completed; there were also two furnaces completed. Both mill and furnaces were owned and managed by men of but little experience in this matter; the mill would save only from 30 to 50 per cent. of the gold and silver, and the furnaces were a total failure.

In December, 1872, a third furnace was completed, and managed by an expert. This furnace has been a success; yet there is a question now about good smelting ores, as experience proves the ores of this district to be base milling ores, which require chloridizing, roasting, and amalgamation.

Within the past year there have been shipped to San Francisco about 120 tons of ore, averaging in value \$600 per ton. Of gold and silver bullion there have been shipped about \$35,000, and of base bullion about 10 tons. As the greater part of this is now in transit, the value is not yet known, but it is estimated at \$600 per ton, or worth \$6,000 in gold and silver. During the years 1871 and 1872 work was generally done on the surface, and until July of the last year but few shafts were down lower than 30 feet. It was found that in sinking from 20 to 40 feet most of the gold, silver, and lead ores gave out, and the ledges turned to iron sulphurets or arsenides. At water-level but little ore

was found of value. Miners became discouraged, and many left the district in disgust. During the latter part of the year 1872 some of the more sanguine miners commenced sinking below the water-level. Silver-ores soon came in, and there is not a single instance reported where a valuable mine was not found within 10 feet of the former stoppage. The ores are generally antimonial or ruby silver, with sulphurets and the native metal.

At the present time miners are laboring under a greater disadvantage than ever before, although they are certain that they have valuable mines. It will require machinery to handle the water, and this requires capital. Some companies have been incorporated in San Francisco, and help is expected from that city. Until that is forthcoming, rapid progress will certainly be impossible.

There have already been located in this district 2,700 claims for companies, and about 1,000 of them are on separate ledges, the rest being on extensions. Several other new districts have been located within the past year. The Maynard district, located about ten miles south of the Wallapai district, is one of them. The Cedar district, about sixty miles south of the Wallapai, is another. Both districts are promising well. Preparations are being made for shipping ore from them at an early day. Preparations are also being made for putting up a mill and roasting-furnaces in the Wallapai district. When this is done, the district will have a better chance. The most valuable mines are located ten miles north of the original discoveries in the southern part of the range. The locations are scattered within a distance of fifteen miles. There are at the present time about twenty-five shafts, on as many different ledges, below the water-level, and the prospects, so far as richness of the mines is concerned, are truly flattering. But most of these mines will be compelled to suspend operations soon, on account of too much water. Mr. Hardy, at the end of the year, was prospecting the Fairfield, and three shifts of three men each, besides two men to assist outside, or eleven men at \$4 per day, were employed. The shaft was down 150 feet, 20 feet below water-level, and 200 gallons of water per hour had to be drawn up by hand. It is seen from this that under such circumstances profitable mining is difficult, even on veins carrying as rich ores as those of Wallapai.

The following data in regard to individual claims are furnished by Mr. W. F. Henning, a member of the legislature of Arizona Territory:

Little Tiger, situated at Stockton, shaft over 100 feet deep. At bottom, vein $2\frac{1}{2}$ feet wide. Very rich in native silver, ruby silver, and black sulphurets.

Cupel, near the former mine; about the same amount of work is done here as on the Little Tiger. The vein exhibits about the same quality and quantity of ore. Work has been recently suspended on account of over-abundance of water.

Empire, situated in Empire Cañon, near Chloride, has two shafts of 100 feet each, and some drifting has been done; ledge-matter is several feet wide; exhibits a large body of rich sulphuret-ore. Work was recently suspended on account of too much water. These mines all belong to the Cirbat Consolidated Company, of San Francisco, and the work has been done chiefly during the past summer. Hoisting-works for each of them are expected from San Francisco in the course of one or two months, and work will then be resumed.

Sixty-two, situated near Stockton, and owned by an unincorporated company. During the past summer several shipments of ore have been made to San Francisco, at a cost of nearly \$100 per ton, including min-

ing, transportation, sampling, &c. The returns left a handsome profit for the owners.

Lone Star, situated at Mineral Park. During the past year about 150 tons have been worked in a 5-stamp mill. They yielded about \$7,000. Recently, work was resumed in an old shaft, and at a depth of 50 or 60 feet a body of ore, carrying large quantities of native silver and black sulphurets, was uncovered. The mine is owned by a company incorporated under the laws of Arizona. Work is still progressing; water plenty in the mine.

The Keystone has two shafts, about 60 feet deep each. It is situated at Mineral Park; two feet ledge, chloride of silver on top. Just below water-level, a heavy body of ore, carrying black sulphurets, native and ruby silver, has been uncovered in each shaft. The top ore, worked in the 5-stamp mill at Mineral Park, yielded \$200 per ton, and not more than 50 per cent. was saved in the process. Several tons, shipped to San Francisco, yielded \$600 per ton. Ore from the bottom of the shafts assays as high as \$4,800 per ton. The mine was recently sold in San Francisco. Hoisting-works are to be put up about March, 1873, and work will then be resumed.

Besides the mines above mentioned, there are probably one hundred other locations, nearly as well developed, and giving promise of permanency and great value. Among them are the Todd mine, the Washington, the Independence, the Dexter, the Vanderbilt, the New Era, the Washington No. 2, the Donahue, the Treasure Hill, the Valley View, the Ida, the Bobtail, &c.

PART II.

METALLURGICAL PROCESSES.

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CHAPTER XI.

TREATMENT OF GOLD-BEARING ORES IN CALIFORNIA.

The gold-bearing ores of California* consist chiefly of quartz—in but a few instances of slates. The gold is usually disseminated through the rock in small metallic particles, sometimes scarcely visible to the naked eye. Sulphides of iron, lead, copper, and zinc, and arseniurets, are frequently associated with the gold; but these rarely constitute more than 6 per cent. of the rock, and average, perhaps, only 1 per cent. Galena is considered the most favorable indication of the presence of gold in the quartz. Most of the gold contained in the sulphides appears to be in the metallic state, as the greater part can be separated by a grinding operation in a porcelain mortar, combined with a careful washing off of the slimes. To extract the gold from these ores, they are subjected at present to a mill process, which, with necessary machinery and apparatus, will be described in these pages.

The rock is generally delivered at the mill free from any large amount of waste. The small quantity left by the miner is thrown aside at the mill. It consists, according to the mineralogical character of the walls of the vein, chiefly of talcose, chloritic and clay slates, serpentine, diorite, and granitic rocks in general.

The treatment of the quartz comprises the following operations:

1. Crushing it by means of rock-breaker and stamps, and amalgamating the freed gold, outside of the battery, by various contrivances.
2. Concentrating the freed gold lost by the above methods, with the auriferous sulphurets.
3. Extracting the gold contained therein by chlorination or pan-amalgamation.

The process of amalgamation in battery on copper plates is also practiced in California, but is gradually displaced by the above mill operations. It is described in the Mining Commissioner's Report of 1870, on the treatment of Colorado ores, and will be omitted here.

I.—CRUSHING AND FIRST AMALGAMATION.

Previous to a final pulverization in stamp-mills, the quartz is broken to a small and somewhat uniform size by rock-breakers. (For a description of Blake's rock-breaker see Mining Commissioner's Report of 1870, page 648.) The jaws are usually set from 1 to $1\frac{1}{4}$ inches apart, opening out to $1\frac{1}{2}$ to 2 inches. The shoes are of white iron, cast in sand and slowly cooled. The rock-breaker discharges upon a platform in front of the feed side of the battery.

(a.) *Arrangement of the battery of a stamp-mill.*—For the purpose of erecting a battery a pit is sunk to the solid bed-rock, the bottom of which is nicely leveled off for the reception of the mortar block, *a, a*, (Plate I,) having a section of 3 by 5 feet, and rarely exceeding 10 feet

* This chapter is the work of Mr. G. F. Deetken, of Grass Valley, a leading metallurgist of California, the introducer into the State of the Plattner chlorination, and a very acute and trustworthy observer. His analysis is based upon practice at the Grass Valley Mills, considered, as a whole, the best system in use in California.—R. W. R.

in length. It is set on end, and consists of two logs 36 by 30 inches each, firmly bolted together with $1\frac{1}{4}$ -inch bolts, and also connected with dowels 18 inches long, and of a section of 8 by 8 inches, introduced 2 feet from each end. The horizontal section of the pit leaves usually a space, *m, m*, of 24 inches all around the mortar-block, which is filled with hydraulic concrete up to the level of the floor of the mud-sills, from 4 to 5 feet below the top of the mortar-block.

After carefully leveling and planing the top of the block, it is ready for the reception of the iron mortar, which is fastened to the block by means of six $1\frac{3}{4}$ -inch key-bolts, *k, k*, Fig. 1, passing through the bottom flanges of the mortar.

The wooden battery frame which carries the cam-shaft is independent of the mortar-block. The wood-work is usually of sugar-pine. The mud-sills, *l, l*, 24 by 24 inches, usually 3 or 4 in number, are laid parallel with the cam-shaft. The sills on each side of the mortar-block are secured by iron bolts passing through the hydraulic concrete, with an iron anchor-plate underneath. Cross-sills, *p, p*, 18 inches wide by 24 inches deep, and 18 feet long, at right angles to the mud-sills, carry the main posts, 12 by 24 inches in section, to which the cam-shaft is attached. They are let and keyed into the posts in the manner represented in Fig. 1.

The mortar, Plate II, Fig. 1, consists of a single casting 3 feet 9 inches high. The bottom is usually 3 inches thick, and sometimes more.

The walls are vertical outside, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches thick on the bottom, tapering to $\frac{1}{2}$ inch on the top. The bottom flanges for fastening the mortar to the block are $2\frac{1}{2}$ inches thick and 4 inches wide. In order to prevent the premature destruction of the mortar near the dies, cast-iron plates, *j, j*, 1 inch thick and about 24 inches high, are placed all around the inside as a lining, which can be replaced when worn out. Being wedge-shaped at the lines of contact with each other, they do not need any additional fastening.

On one of the long sides of the mortar, opposite the discharge opening, *d*, the feed slit, *n*, is situated. It is from 6 to 12 inches below the top of the mortar, and 3 inches wide, extending across the whole width of the mortar. A rim of 3 inches around the discharge opening, *d*, is planed off for the purpose of receiving the sieve frame, Plate II, Fig. 3, and the splash-box, Fig. 2, both of cast iron, which are bolted to it. The horizontal mortar-bed receives the dies, *t*, the bottom or foot-plates of which fit almost close to the sides of the mortar, lined with the plates *j, j*.

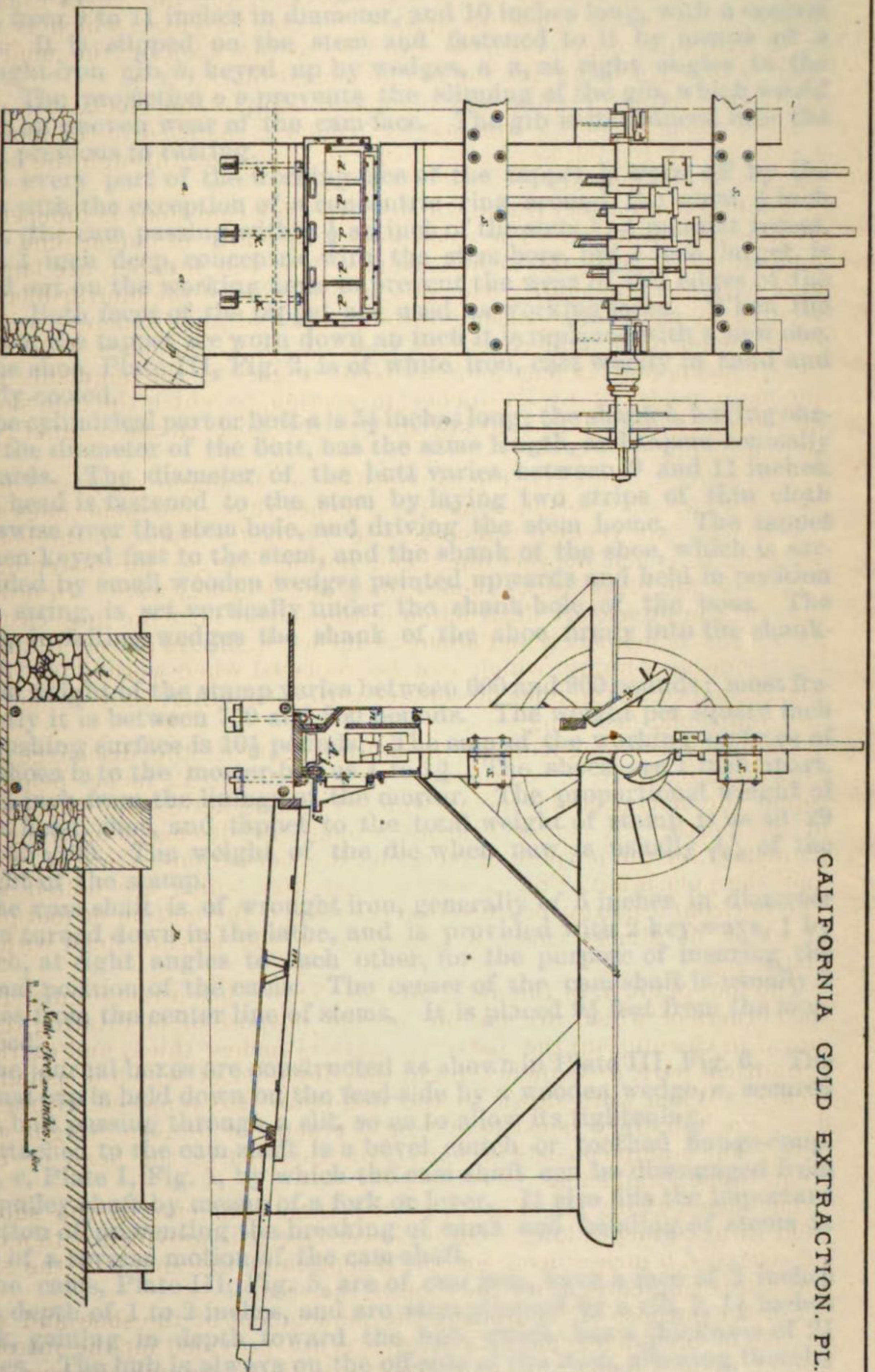
The foot-plate, *a*, of the die, Plate III, Fig. 1, has a rectangular form, the corners of which are cut off for the purpose of facilitating its removal in cleaning up the battery. It is $1\frac{1}{2}$ inches thick, and carries a cylindrical part, *b*, $3\frac{1}{2}$ inches high, the diameter of which is usually 10 inches. When worn down to the foot-plate it is replaced with a new die. Each battery consists of 4 or 5 stamps of uniform weight when new. The stamp consists of four cylindrical parts, the head or boss, stem, tappet, and shoe.

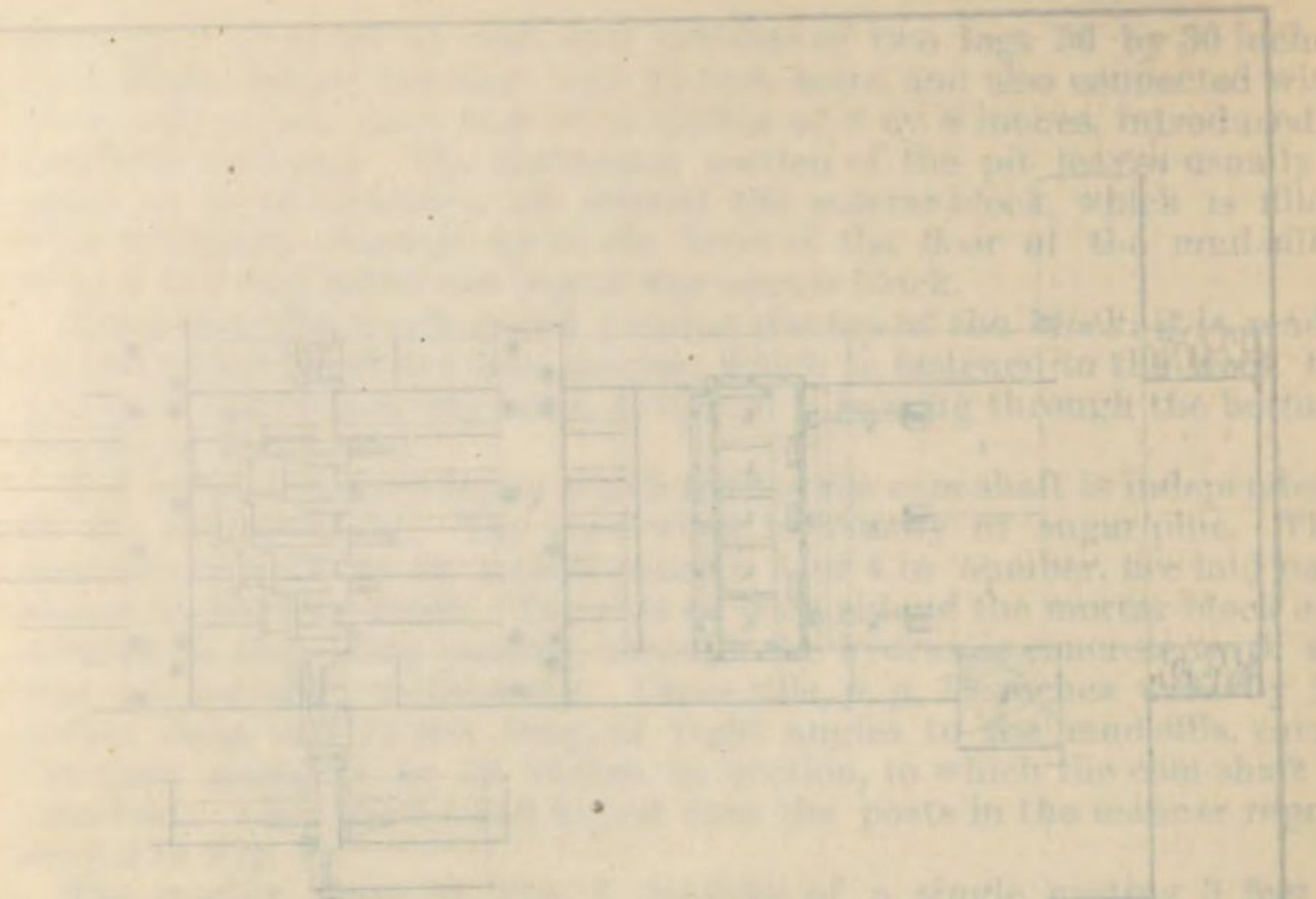
The head, Plate III, Fig. 3, of the same diameter as the shoe, is from 15 to 20 inches long. On its lower face it is provided with a conical recess, *f*, 6 inches deep, for the reception of the shank of the shoe, and a tapering core, *d*, for the foot of the stem.

For the purpose of facilitating the detachment of the shoe and stem in case of breakage, channels, *m, m, o, o*, are provided for the introduction of wedges below the same, passing radially through the boss.

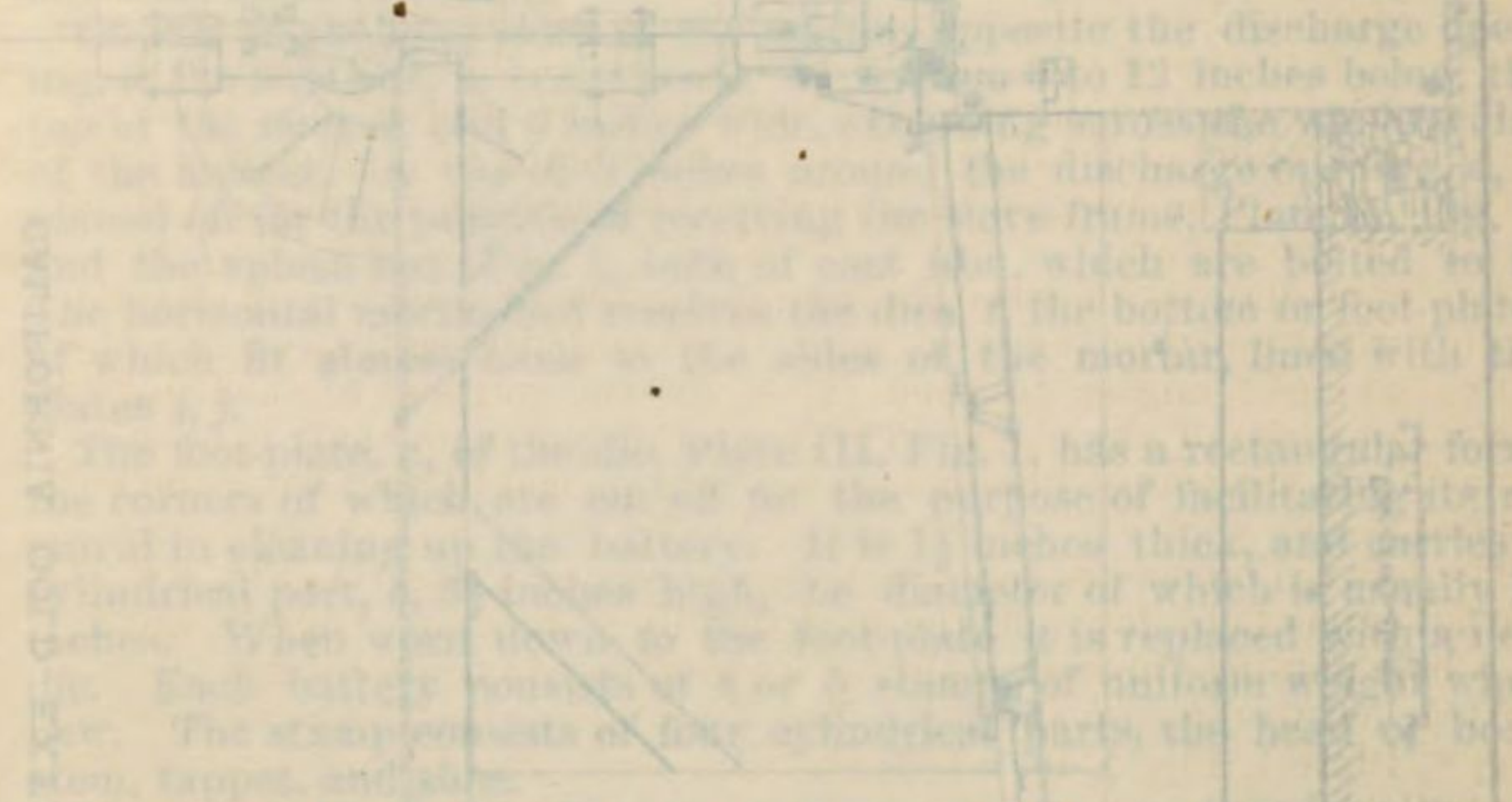
The stem, *a*, Plate III, Fig. 4, is of wrought iron, and varies in length

CALIFORNIA GOLD EXTRACTION. PL. 1.





The drawing shows a cross-section of a mechanical assembly. The central part is a vertical shaft or piston rod, surrounded by a housing or cylinder. There are several horizontal lines indicating different levels or components. The drawing is oriented vertically on the page.



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from 13 to 15 feet, and in thickness from 3 to $3\frac{1}{4}$ inches. It is turned true upon the lathe. Six inches of both ends are turned off somewhat tapering, so that either end can serve as the foot.

The tappet *r r*, Plate III, Fig. 4, is in the main a cylinder of cast-iron, from 9 to 11 inches in diameter, and 10 inches long, with a central bore. It is slipped on the stem and fastened to it by means of a wrought-iron gib, *b*, keyed up by wedges, *n n*, at right angles to the gib. The projection *o o* prevents the slipping of the gib, which would cause an uneven wear of the cam-face. The gib is introduced into the mold previous to casting.

As every part of the working-face of the tappet is worn off by the cams with the exception of a concentric ring around the stem, $\frac{1}{2}$ inch wide, (the cam passing within $\frac{1}{2}$ an inch of the stem,) an annular recess, *m m*, 1 inch deep, concentric with the stem-bore, but 1 inch larger, is bored out on the working-faces to prevent the wear of the edges of the cam. Both faces of the tappet are used as working-faces. When the faces of the tappet are worn down an inch it is replaced with a new one.

The shoe, Plate III, Fig. 2, is of white iron, cast wholly in sand and slowly cooled.

The cylindrical part or butt *a* is $5\frac{1}{2}$ inches long; the shank *b*, having one-half the diameter of the butt, has the same length, and tapers conically upwards. The diameter of the butt varies between 9 and 11 inches. The head is fastened to the stem by laying two strips of thin cloth crosswise over the stem-hole, and driving the stem home. The tappet is then keyed fast to the stem, and the shank of the shoe, which is surrounded by small wooden wedges pointed upwards and held in position by a string, is set vertically under the shank-hole of the boss. The stamp in falling wedges the shank of the shoe firmly into the shank-hole.

The weight of the stamp varies between 600 and 900 pounds; most frequently it is between 750 and 850 pounds. The weight per square inch of crushing surface is $10\frac{1}{2}$ pounds. The sum of the working surfaces of the shoes is to the mortar-bed as 1 to $1\frac{3}{4}$. The shoes are 1 inch apart, and 1 inch from the linings of the mortar. The proportional weight of stem, head, shoe, and tappet to the total weight of stamp is as 40:29:16:15:100. The weight of the die when new is usually $\frac{1.5}{100}$ of the weight of the stamp.

The cam-shaft is of wrought iron, generally of 5 inches in diameter when turned down in the lathe, and is provided with 2 key-ways, 1 by $\frac{3}{4}$ inch, at right angles to each other, for the purpose of insuring the normal position of the cams. The center of the cam-shaft is usually 5 inches from the center line of stems. It is placed $9\frac{1}{2}$ feet from the mortar-bed.

The journal-boxes are constructed as shown in Plate III, Fig. 6. The journal-cap is held down on the feed-side by a wooden wedge, *a*, secured by a bolt passing through a slit, so as to allow its tightening.

Attached to the cam-shaft is a bevel clutch or toothed flange-coupling, *v*, Plate I, Fig. 1, by which the cam-shaft can be disengaged from the pulley-shaft by means of a fork or lever. It also fills the important function of preventing the breaking of cams and bending of stems in case of a reverse motion of the cam-shaft.

The cams, Plate III, Fig. 5, are of cast iron, have a face of 3 inches by a depth of 1 to 2 inches, and are strengthened by a rib, *b*, $1\frac{1}{4}$ inches thick, gaining in depth toward the hub, which has a thickness of $2\frac{1}{2}$ inches. The hub is always on the off-side of the stem, allowing thereby a close approach of the cam-shaft to the stem center. Two cams, stand-

ing diametrically opposite, Plate III, Fig. 5, are always attached to one hub, which is strengthened by a wrought-iron band. The cam-curve is an involute of a circle, slightly modified at the end, as the point of application of the lifting force is removed at the end of each lift from the center line of stems to the end of the working face of tappet. Fig. 5 shows the construction, $a n$ being the distance from center of cam-shaft to center of stem, $n a$ the length of the greatest lift *plus* distance from center of cam-shaft to the first front of contact of cam with tappet. The curve $b a$ is changed to $b a'$; $a a'$ is in this case $\frac{3}{8}$ of an inch.

The lift varies between 8 and 11 inches, generally it is 10 inches, with a corresponding cam curve of $21\frac{1}{2}$ inches. The friction between cam and tappet causes the stamp to revolve, insuring an even wear of the shoe.

The mortar, Plate I, Fig. 1, is covered by two 3-inch planks, e , which are held in position by bolts, $m m$, attached to the side of the mortar. They join in the center line of stems, and are provided with semi-cylindrical grooves for the stems.

The guides, of sugar-pine, are 15 inches deep and 10 inches broad. They are firmly bolted to the uprights carrying the cam-shaft. The center of the upper guides is 3 feet 4 inches above, and the center of lower guides 4 feet below, the center of cam-shaft. A wooden lining, consisting of two 3-inch planks, 15 inches deep, with semi-cylindrical grooves to fit and inclose the stems, is bolted on to the main guide-timbers. The grooves are lubricated with tallow. The whole arrangement is shown at s, s , Plate I, Fig. 1.

The discharge or sieve frame, Plate II, Fig. 3, is of cast iron, and divided into 5 panels, $11\frac{1}{2}$ by 15 inches.

The screen, of nearly the same size as the panel, but exceeding it about $\frac{1}{2}$ inch all around, is bolted tight to the panels by means of a cast-iron frame, Plate II, Fig. 4, 3 inches deep. A blanket-binding is sewed around the edge of the screen to make a tight joint.

The screen, Fig. 5, is made of Russia iron, weighing $\frac{8}{10}$ pound per square foot. The rectangular holes, punched by machinery, are $\frac{3}{8}$ of an inch long, and wide enough to allow the passage of a No. 6 sewing-needle. The holes are $\frac{3}{8}$ inch apart horizontally, and their centers $\frac{5}{8}$ inch apart vertically, leaving a space of $\frac{1}{4}$ inch between them. The turned-up edge faces the inside of the mortar. When the turned-up, tapering edge is worn down, the holes are closed or made smaller by pounding the edges with a mallet.

The splash-box, of cast iron, Plate II, Fig. 2, provided with three discharge-spouts, is tightly bolted to the mortar with the aid of blanket-packing.

The manner of bracing the uprights of the cam-shaft is seen in Plate I, Fig. 1.

As the strain of the belt is in the direction of the discharge, no bracing is needed on the feed-side, which gives a clear working space on the feed-side of the battery.

The stamps are usually raised for repairing by means of a tackle, which is suspended in the line of the stamps on a roller strap sliding on a beam. They are held in suspension by props, $f f$, Plate I, Fig. 1.

The water is supplied to the battery by a 3-inch iron pipe, h , (Plate I, Fig. 1,) passing over the feed-slit near the top of the mortar. The vertical discharge is through small round apertures, which can be closed by wooden plugs. There is also a $1\frac{1}{2}$ -inch iron water-pipe along the discharge-side of battery for increasing the quantity of water over the blanket-sluices.

The power is usually derived from high-pressure steam generated with wood, the universal fuel of the mills, or from a water-wheel. It is transmitted to a main shaft, from which the battery and all other machinery are driven by means of belting. A 10-stamp battery with auxiliary amalgamating machinery is driven by a belt from 10 to 13 inches wide.

(b.) *The operation of the mill.*—The rock is delivered from the mine in cars, containing each, say, 13 cubic feet, of a weight of 1,300 pounds, in front of the rock-breaker. At custom mills the quartz is delivered in wagons, the crushing being paid by the load, consisting of about 35 cubic feet of a weight of 3,500 pounds, including moisture.

The object of crushing being to liberate the fine particles of metallic gold, disseminated through the quartz, so that they can be collected or caught by blankets and subsequently amalgamated, a fine crushing is always desired. Fast crushing is not prejudicial to the saving of the gold in this process, the gold being leisurely collected and amalgamated, outside of the battery, after crushing.

This is a distinguishing feature of the blanket-process as compared with the method of amalgamating in battery while crushing.

The rock-breaker, making 170 strokes of $\frac{3}{4}$ of an inch a minute, is capable of a preparatory crushing of 72 tons of quartz, the crushing capacity of a heavy 30-stamp mill, in twenty-four hours. The shift at the rock-breaker consists of ten hours, no night-work being done. It increases the crushing capacity of a mill, on an average, 20 per cent.

Only the coarser quartz is passed through the breaker; the finer, containing always a quantity of wooden splinters from the mine, is crushed by itself in a separate battery. The splinters cause a loss of efficiency of the battery by clogging up the screen-holes. The screens require, in consequence, a greater amount of attention.

The feeding of the battery is done by hand, and is regulated so that there shall not be more than 2 inches of sands between die and shoe at the end of every drop. A good feeder knows to some extent the requirement of the battery by the clear or dull sound of the stamp-stroke. The number of drops of the stamp per minute varies from 50 to 70, the lesser number corresponding to the heavier, the greater to the lighter stamps. A battery of 20 stamps weighing 850 pounds per stamp, with 61 drops of 10 inches per minute, crushes 40 tons of quartz in twenty-four hours without the aid of a rock-breaker, while a battery of 20 stamps weighing 700 pounds per stamp, with 68 drops of 10 inches per minute, crushes 32 tons of the same rock, a No. 6 screen being used in both trials.

The proportion of power necessary to do the work of the heavier to that of the lighter stamps is as $850 \times 61 : 700 \times 68$, and the work expected therefrom would be as nearly 35 tons for the heavy to 32 for the lighter stamps. But the former crush 40 tons, an additional quantity of over 5 tons in favor of the heavy stamps. When the rock-breaker is used in connection, the proportional result is nearly the same. The limit of weight has never been determined experimentally, though stamps are satisfactorily employed weighing over 900 pounds with a 10-inch drop. These results are on mill-rock of average hardness.

The quantity of battery-water depends upon the amount of sulphurets or black iron-sands in the quartz. It averages half a cubic foot per minute to the stamp. It must be sufficiently large to move the crushed sands over the blankets without allowing them to permanently settle upon them. Less grade to the blankets and more water is preferred to the reverse condition.

The bottom edge of the lower screen-holes is 3 inches above the dies when new. The battery-water during the crushing has a wave motion

along the screens. The water has its natural temperature while passing through the battery and over the blankets. Further on, when passing through the rubbers and copper plates, it is warmed somewhat by the influx of hot water from the amalgamators.

After leaving the battery the crushed sands are distributed by the spouts *g g*, (Plate I, Fig. 1,) on two sets of sluices, *m m*, covered with woolen blankets. There are three sets of blanket-sluices for every 4 or 5 stamp battery. Each set consists of two sluices made of $1\frac{1}{4}$ -inch planed sugar-pine boards, one $10\frac{1}{2}$ feet long, the other $5\frac{1}{2}$ feet, with a drop of 3 inches between them. They are from 16 to 17 inches wide, with sides of 2 inches in the clear, and have a grade of $\frac{3}{4}$ inch to $\frac{7}{8}$ inch to the foot.

The upper sluice *m* carries two strong blankets, 21 inches wide and $5\frac{1}{4}$ feet long each, the upper overlapping the lower blanket about 6 inches. The lower sluice *m* carries only one blanket.

The blanketing is manufactured for the mill-trade, shorn on the lower side, with the nap on the upper. It weighs $\frac{8}{10}$ of a pound per running yard.

The flow of the pulp is over two of the three sets of blanket, the third one being kept in reserve for use when washing the blankets of either of the others. The upper blankets, which catch the bulk of the gold, are washed every twenty minutes, the lower one every two hours. The washing is performed in two tanks, used alternately. They are made of $1\frac{1}{2}$ -inch planed pine boards, have a horizontal section of 3 by 4 feet, and taper toward the bottom. They are $2\frac{1}{2}$ feet deep, and are provided with inclined shelves for the blankets and plug-holes for the discharge of water after the settling of the blanket-washings. The water used in these tanks is warmed in a heater by the waste steam.

The quantity of crushed sands passing over the blanket-sluices of a 5-stamp battery is 12 tons in twenty-four hours, while the blanket-washings, consisting of gold, sulphurets, iron, and quartz sands, vary considerably in weight with the percentage of the metallic contents of the rock. The average quantity of dry blanket-washings may be estimated at $12\frac{1}{2}$ per cent. of the rock crushed. They are introduced by the blanket-washer into a box in front of the amalgamators, from which they are swept gradually into the same by a current of clean, heated water of a temperature of from 100° to 130° Fahrenheit.

The amalgamator* (Plate IV, Fig. 1) consists of two hollow cylindrical troughs, *t t*, 17 inches long and 4 inches to 5 inches deep, of wood or iron, which are filled with pure quicksilver, over which the blanket-washings are directed. The gold being specifically heavier than the quicksilver, will sink to the bottom, with the exception of that part which is attached to the quartz or sulphuret, and is, consequently, buoyed up.

The floating skimmings are agitated by wooden cylinders, *c c*, of 8 inches diameter, suspended parallel to and over the center line of the trough, and provided with radial arms of $\frac{1}{4}$ -inch round iron, the ends of which are slightly curved. These arms are set along the cylinders in 12 longitudinal rows, containing alternately 8 and 9 arms, those of each row being set opposite the spaces in the next. They are not allowed to dip into the quicksilver, but almost touch it. The cylinders are 2 feet 10 inches apart between the centers, and are 6 inches below each other. They make 60 revolutions per minute, and are driven by small belts. The arrangement for insuring a steady flow of blanket-sands through

* This is the so-called Atwood amalgamator alluded to in my former reports.

the amalgamator is shown in Plate IV, Fig. 1. The connecting-rod $m r$, receiving a horizontal movement from the crank $r s$, transfers it by means of the bent lever $m a b$ to the ratchet $b d$, which moves the endless screw k by means of the wheel d . The endless screw k gives a rotary motion to the discharge-pipe p , attached to the water-trough C, by means of a lever, n , connected with the water-trough shaft o by the rod j . By raising the weight w , suspended at the end of the lever n , the female screw at the opposite end of lever n can be placed at any point along the endless screw, and a change in the inclination of the pipe p can thereby be effected. The female screw on the lever n is part of a nut cut diametrically. On reaching the point g the endless screw ceases to move the lever n .

One amalgamator treats the blanket-washings of two 5-stamp batteries. The quantity of water passing through one amalgamator is one cubic foot per minute.

The tailings of the amalgamator pass through wooden riffle-slucies, (Plate IV, Fig. 3,) generally two in number. They are 9 inches wide each, and have a grade of 1 inch to the foot. The riffles are 6 inches apart, and from $\frac{5}{8}$ inch to $\frac{3}{4}$ inch deep at the lower end. They are filled with pure quicksilver, each riffle presenting a bright surface of from 2 to 3 inches in length, by a width of 9 inches. There are generally from 20 to 30 riffles to one sluice.

The skimmings from the amalgamator and the quicksilver riffles, varying between $\frac{1}{10}$ and $\frac{1}{2}$ of one per cent. of the crushed sands, are ground and amalgamated in slow-grinding pans, combining, with a minimum loss of quicksilver, a good result. A Knox pan, of the form most generally adopted, is capable of grinding the skimmings of a 30-stamp mill in twenty-four hours, in three separate charges. Plate IV, Fig. 2, represents this pan in vertical section and plan. It is of cast iron, 4 feet in diameter and 14 inches deep. The sides are $\frac{1}{2}$ -inch, the bottom $\frac{3}{4}$ -inch thick. The pan is supported by 4 legs, $l l$, of cast iron, bolted to the floor, and attached to the pan in the usual manner of a stove-leg. Cast-iron projections on the legs support the cross-bars bearing the driving-shaft. The vertical pinion-wheel can be put in or out of gear by a bevel-clutch, worked by lever.

The pan has a false bottom, t , $1\frac{1}{4}$ inches thick, with projecting vertical rim at the periphery, to form a hollow annular space underneath for the introduction of steam. There is also a radial groove in the false bottom, $1\frac{1}{8}$ inches wide and 1 inch deep, for the accumulation of quicksilver and amalgam, connecting with the lower discharge-hole situated opposite the driving-shaft. The upper discharge-hole is 4 inches above the lower one. They are closed by wooden plugs of 2 inches diameter.

The center of the yoke d , attached to the muller m is keyed to a vertical wrought-iron shaft, s , of 2 inches diameter, guided by a cast-iron hollow cone in the middle of the pan. The muller m consists of a flat ring of cast iron, of an inside diameter of 10 inches, $4\frac{1}{2}$ inches wide and 1 inch thick, attached to which are four arms at right angles to each other, 12 inches long and 6 inches wide, to which the cast-iron shoes u , $1\frac{1}{2}$ inches thick, are bolted through slits $c c$.

Between the muller and shoe, a wooden shoe, r , of the exact shape of the iron one, and about 6 inches high, is introduced to prevent the settling of the unground pulp on the latter, the upper face of the wooden shoe reaching above the surface of the pulp. The head of the bolt, passing through the shoe and muller-arm, fits into a recess in the bottom of the iron shoe, and wears off gradually with it.

The yoke $n n$, bolted to the muller, serves for the purpose of raising

or lowering it, by means of the screw *f*, resting on the vertical driving-shaft, passing through the center of the pan.

The muller makes from 12 to 14 revolutions per minute, communicated by bevel-gearing from the horizontal shaft, making from 30 to 35 revolutions per minute.

Of skimmings, 100 pounds are charged into the pan, and water is added until the pulp will just adhere to a stick dipped in, without dropping off. After three hours' grinding, the pulp is heated up by steam under the false bottom. The chemicals, introduced at the same time, consist of one cupful of a mixture of equal parts of saltpeter and sal ammoniac. About 5 pounds of mercury are added for every charge, simultaneously with the chemicals, to the amount in the pan, which consist, for the first charge, of from 10 to 15 pounds. After an amalgamation of three hours, the pulp, now very fine, is diluted with water and a few handfuls of caustic lime are added, which is found to aid the coagulation of the quicksilver particles to a great extent. The diluted pulp, reaching within 1 to 2 inches of the top of the pan, is agitated about 20 minutes, after which it is discharged, while the muller is kept in motion, through the upper plug-hole, and, subsequently, through the lower. A bucket, placed in front of the discharge-holes, catches any quicksilver or amalgam which escapes during the discharge. When a clean-up is required, the quicksilver and amalgam, and the small quantity of sulphides yet remaining, are washed into the bucket. Quicksilver is added and the skimmings are removed, which go back into the pan again to be reground. The amalgam is worked by hand; the lumps are broken up; the impurities floating on the surface are removed, and the bright quicksilver is strained through a canvas filter.

The whole of the pulp from the pan is made to run into a large tank and settled. It still retains in many cases a considerable quantity of gold, amounting to as much as \$100 to the ton. They are added to the coarser sulphurets, which are subsequently saved by a process presently described in these pages and treated by chlorine process.

The sands, after passing the blankets, and also those from the amalgamators, discharge into the Eureka rubbers, in which the particles of gold are intended to be further cleaned and brightened by rubbing and detached from the sands, while they have an opportunity at the same time to be caught on the amalgamated copper plates of the rubber.

The Eureka rubber, Plate V, Fig. 1, consists of a rectangular cast-iron box, 7 inches deep and 4 feet 8 inches square, provided with a false bottom of cast-iron dies or plates, on which cast-iron shoes, fastened to a wooden frame, receive a rectilinear motion by rods connected with an eccentric. The wooden shoe-boards are covered with amalgamated copper plate.

In preparing the false bottom, wooden boards, *c c c*, Plate V, Figs. 1 and 2, $3\frac{1}{2}$ inches wide and 1 inch thick, of the length of the rubber box, are laid in at right angles to the motion of the rubber frame, leaving a space of 4 inches between them. On top of these the false-bottom plates or dies *d d*, $1\frac{1}{2}$ inches thick, are placed, broad side up, leaving 3 inches between the edges. The spaces *e e* are filled with pieces of soft wood, set up endwise and dressed to fit the false-bottom plates. These wooden blocks are $2\frac{1}{2}$ inches long, 4 inches wide, and from 6 to 12 inches broad. This arrangement is found to answer better for rubbing than a solid cast-iron false bottom. The lower boards *c c* are introduced to give a better hold to the wooden blocks *e e*, after a partial wear of the iron false-bottom plates *d*. These plates are firmly secured by strips of wood, *g g*, 1 inch thick, bolted to the sides of the rubber-

CALIFORNIA GOLD EXTRACTION. PL. 4.

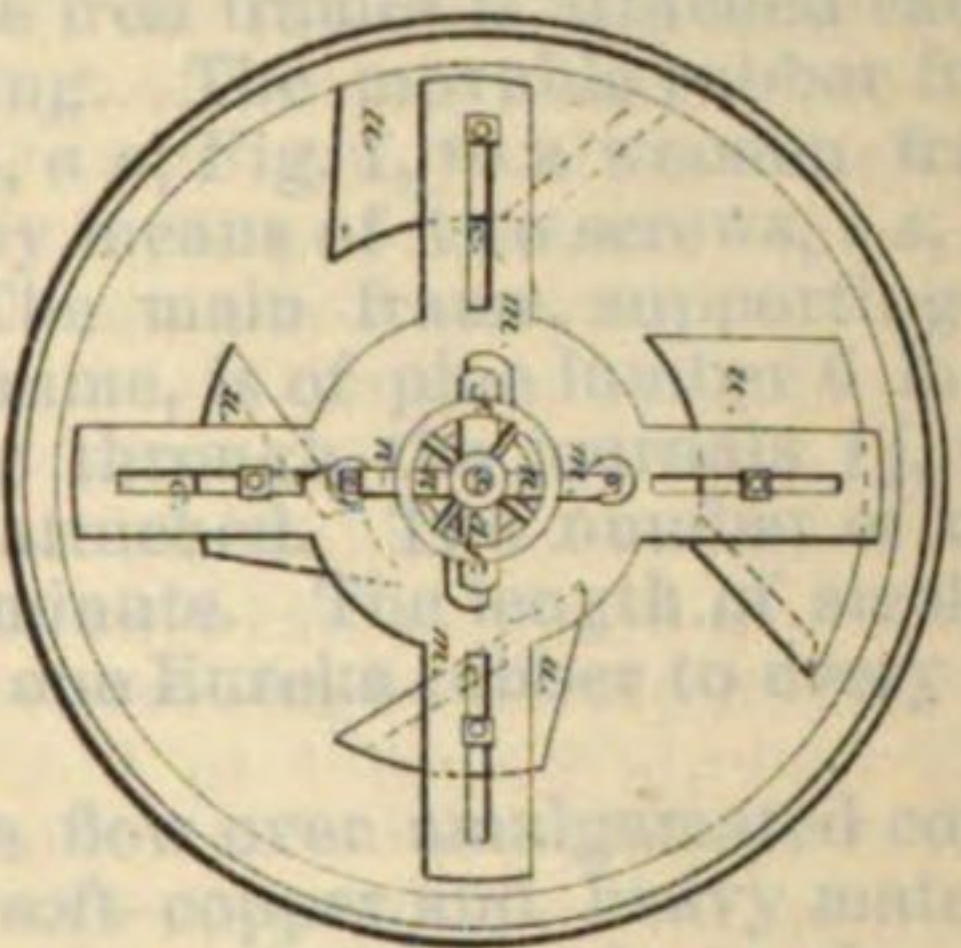


Fig. 2.

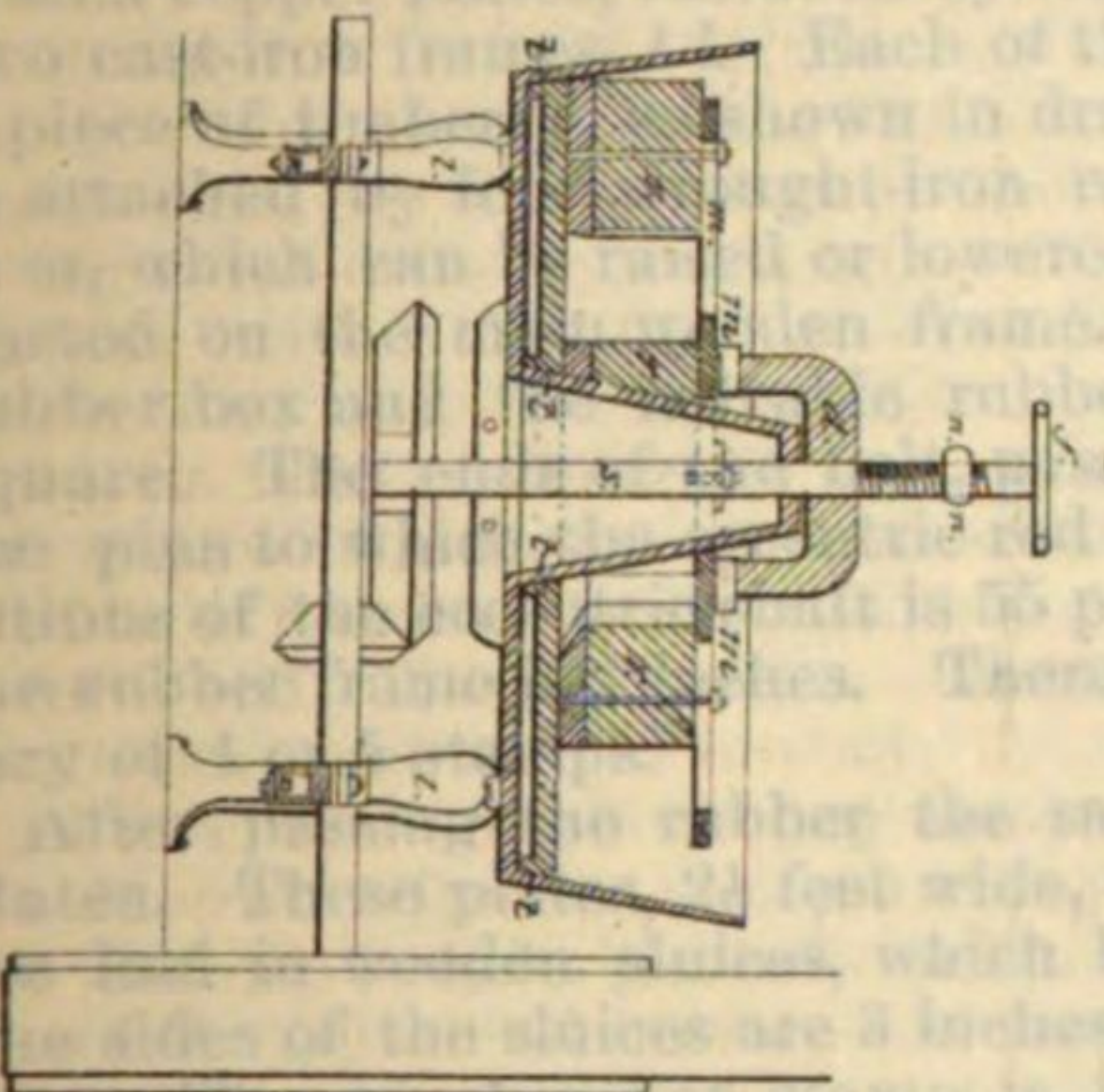
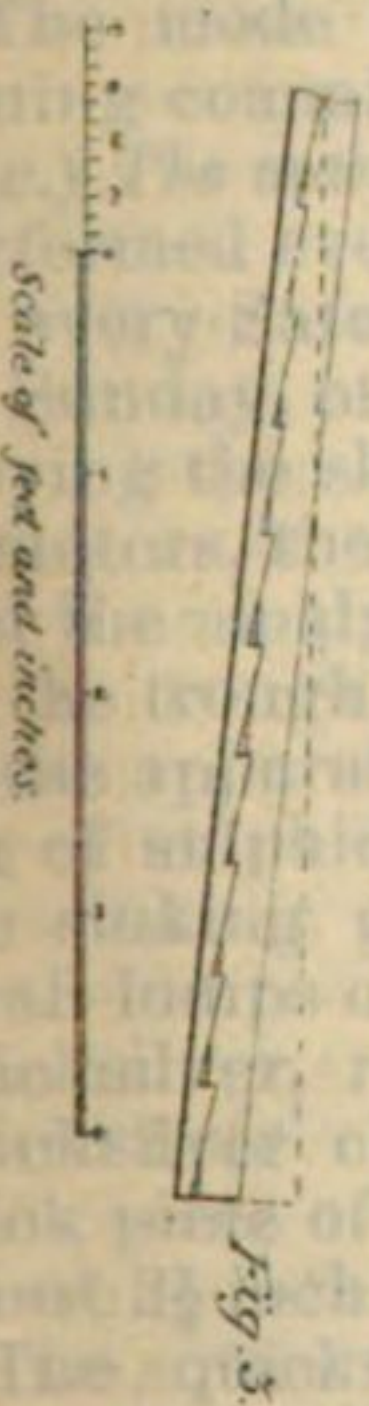
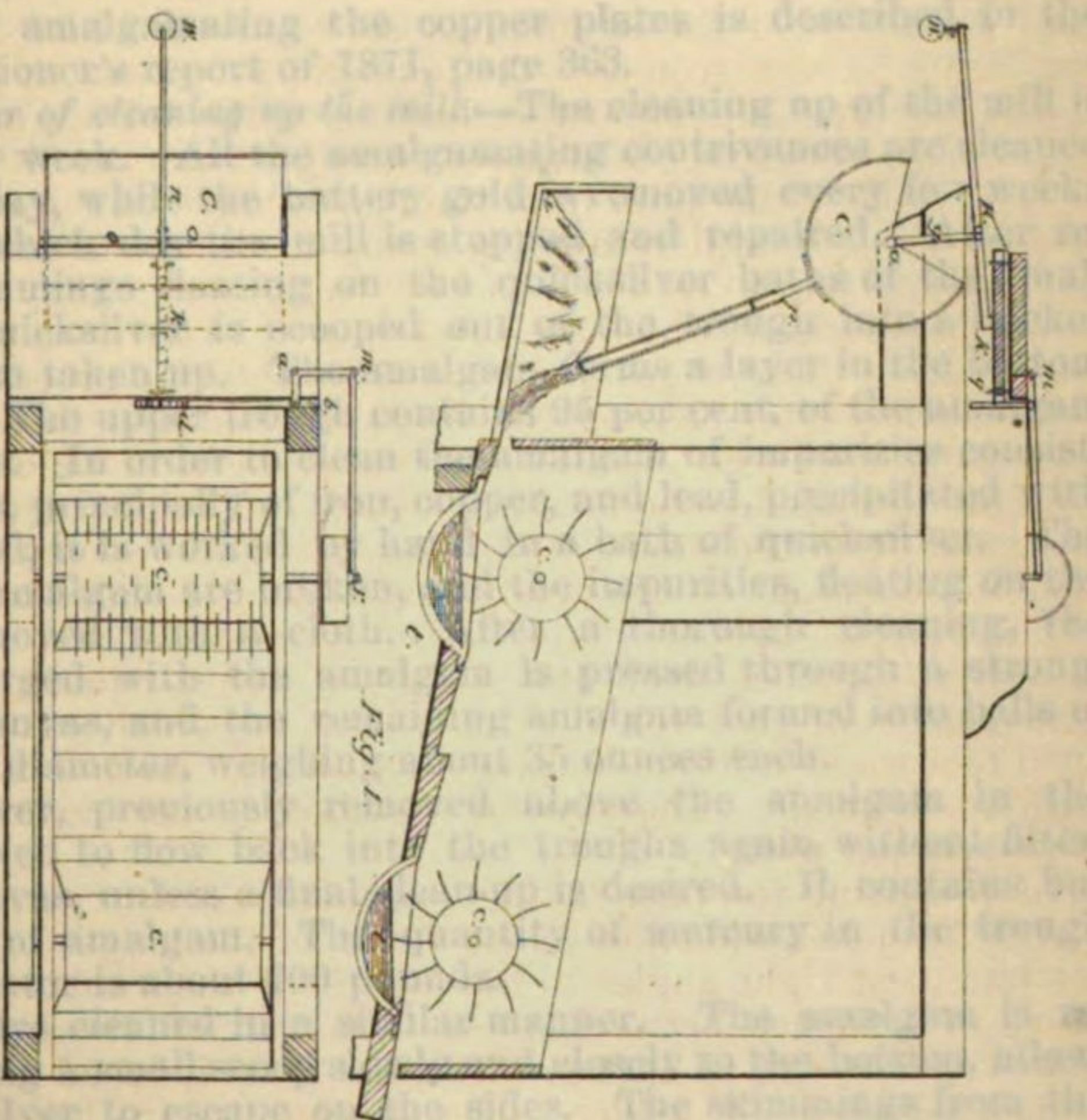


Fig. 1.



Scale of feet and inches.

box, and fitting into the recesses *f f* on both ends of the bottom-plates.

The construction of the movable rubber frame is shown in Plate V, Fig. 2.

The iron and also the wooden shoes *k k*, which carry the amalgamated copper plates, fastened by iron clamps and bolts, are secured by two cast-iron frames, *l l*. Each of these iron frames is attached each to a piece of timber, *g*, as shown in drawing. The movable rubber frame is attached by four wrought-iron rods, *a a*, Fig. 1, to a wooden frame, *m m*, which can be raised or lowered by means of two screws, *s s*, supported on the main wooden frame. The main frame, supporting the rubber box and the movable rubber-frame, is of pine lumber 6 inches square. The ends of the bolt, passing through the journals *j j*, form the pins to which the eccentric-rod is attached. The number of revolutions of the eccentric-shaft is 55 per minute. The length of stroke of the rubber frame is 4 inches. There is one Eureka rubber to every battery of 4 or 5 stamps.

After passing the rubber the sands flow over amalgamated copper plates. These plates, 2½ feet wide, of soft copper and heavy material, are laid in wooden sluices, which have a grade of ½ inch to the foot. The sides of the sluices are 3 inches high. They are from 20 to 30 feet long. Three inches per stamp is the usual width of the copper-plate sluices.

The mode of amalgamating the copper plates is described in the mining commissioner's report of 1871, page 363.

(c.) *The manner of cleaning up the mill.*—The cleaning up of the mill is performed every week. All the amalgamating contrivances are cleaned up every Saturday, while the battery gold is removed every few weeks on Sunday, on which day the mill is stopped and repaired. After removing the skimmings floating on the quicksilver baths of the amalgamators, the quicksilver is scooped out of the trough into a bucket and the amalgam taken up. The amalgam forms a layer in the bottom of the trough. The upper trough contains 95 per cent. of the amalgam in the apparatus. In order to clean the amalgam of impurities consisting of sulphides, principally of iron, copper, and lead, precipitated with the sinking gold, it is worked by hand in a bath of quicksilver. The small lumps of amalgam are broken, and the impurities, floating on the quicksilver, removed with a cloth. After a thorough cleaning, the quicksilver charged with the amalgam is pressed through a strong, thick piece of canvas, and the remaining amalgam formed into balls of about 2¼ inches diameter, weighing about 35 ounces each.

The quicksilver, previously removed above the amalgam in the troughs, is allowed to flow back into the troughs again without filtering through canvas, unless a final clean-up is desired. It contains but a small amount of amalgam. The quantity of mercury in the trough of one amalgamator is about 700 pounds.

The ripples are cleaned in a similar manner. The amalgam is removed by passing a small scoop slowly and closely to the bottom, allowing the quicksilver to escape on the sides. The skimmings from the surface of the ripples are added to those of the amalgamators and treated in the pan.

The amalgam on the copper plates is removed by means of a dull chisel. This operation has to be carefully performed so as not to expose the copper. When the amalgam is removed quicksilver is sprinkled on the plates and spread by means of a piece of rubber belting, and the bright mercurial surface is finally washed with water.

The amalgam from the copper plates is freed from impurities by rubbing it in an iron mortar with an addition of quicksilver, while a current of water flowing in and out of the mortar removes the impurities.

All scum, sand, sulphurets, &c., removed from the amalgam by washing, are subsequently treated in the amalgamating pan with the skimmings.

In cleaning up the battery the stamps are removed from the mortar by means of block and tackle. The corner die, provided, near the foot of the cylindrical body, with a wedge-shaped recess for the introduction of the crowbar, is started out first. All the casings are removed by the same means. Dies and casings are raised and taken out of the battery. The battery is cleaned, and the sands are washed through a sieve of 81 to 100 holes per square inch into a wooden hopper, through which they are discharged into a wooden sluice-box 6 inches wide and 6 feet long, and provided with 3 to 4 ripple-boards to catch the particles of gold. The sluice has a grade of $1\frac{1}{2}$ inches to the foot. The resulting coarse sands of the sieve, after removing the iron by hand or magnet, are returned to the battery, while the finer sands which passed through the sieve are treated by pan amalgamation. When poor, they also go back to the battery. The gold taken out of the ripples is freed of accompanying sand and iron by panning and the magnet, and is added to the amalgam.

When the mortar is emptied, worn-out dies, casings, and shoes are replaced by new ones. Before the old shoes and dies are returned to the foundry for recasting, they are overhauled for gold, frequently found in the crevices.

The amalgam, containing from 36 to 40 per cent. of gold bullion, is retorted in cast-iron pans, placed into cast-iron cylinders or retorts, supported by brick work on flanges. The cylinders are set nearly horizontal, with a slight inclination toward the rear end, so as to give the quicksilver, condensed on the front cover, an opportunity to flow back to the rear end, surrounded by the fire. The rim of the front plate or cover of the retort is provided with soft fine clay, and firmly screwed to the rim of the retort by means of a clamp to make it air-tight.

A cylindrical retort of about 11 inches in diameter, and 4 feet 6 inches long, will hold five trays of a capacity of 1,350 ounces of amalgam. The fire-grate for a retort of this size is 1 by 2 feet, section of chimney 4 by 8 inches. The quicksilver condenses in an iron pipe, surrounded and cooled by water. The pipe is attached at the rear end near the roof of the retort, and descends into a water-basin. The heat generated by wood on the grate under the front of the retort, passes through a return flue over the same into the chimney placed over the front face of the retort. When the retort has been in a cherry-red heat during two hours, the retorting is considered complete. The time of retorting, varying with the quantity of amalgam in the retort, is from four to six hours, starting with a cold furnace. After giving the retort ample time for cooling, the front plate is removed. The gold bullion consists of a somewhat porous mass, and when of well cleaned amalgam has a bright yellow surface. It still contains a small amount of mercury, and also some sulphides.

The bullion is melted in black-lead crucibles by means of charcoal in air-furnaces usually 16 inches deep and 16 inches in diameter. The fluxes used are chiefly carbonate of soda, a little borax, saltpeter, and sand. No matte is formed. The loss in melting is from 1 to $1\frac{1}{2}$ per cent. of the bullion. The bars are from .700 to .940 fine, containing, in addition to the usual silver, small quantities of copper, lead, and iron. They are sold in the San Francisco market.

CALIFORNIA GOLD EXTRACTION. PL. 5.

Fig. 5.

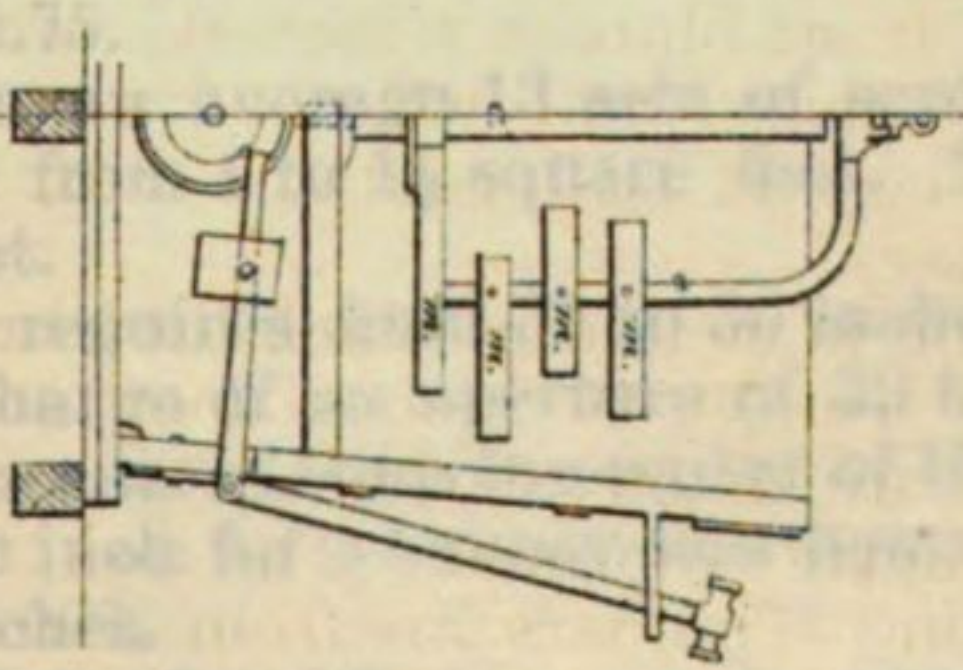


Fig. 2.

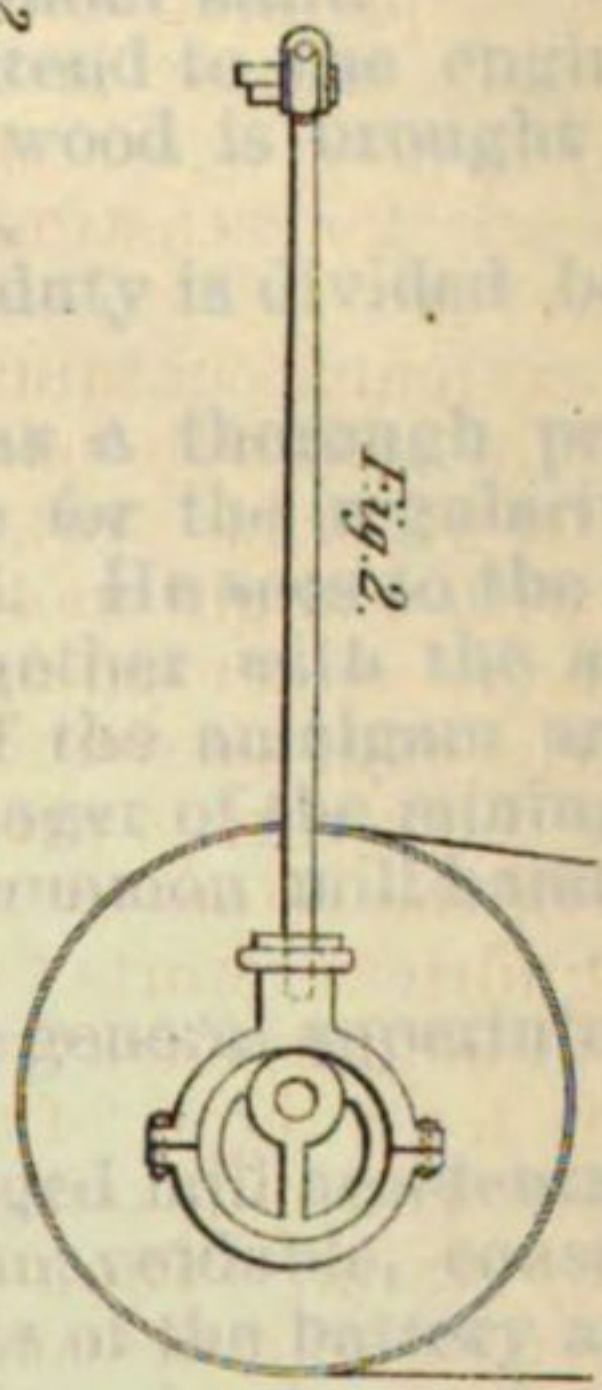
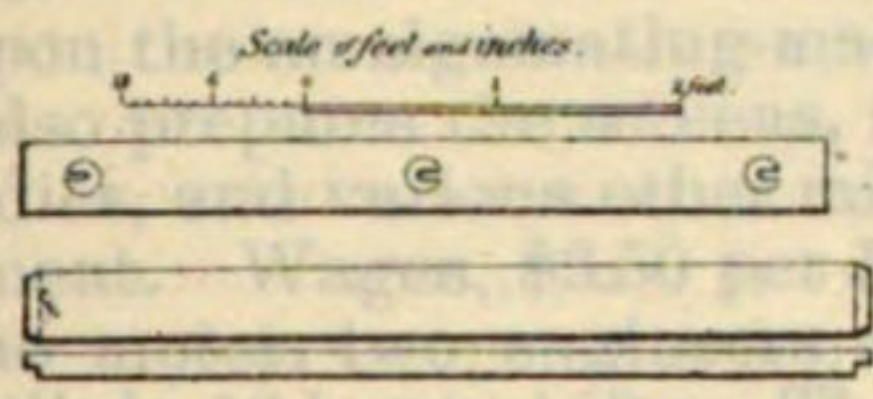


Fig. 2.



Scale of feet and inches.

Fig. 2.

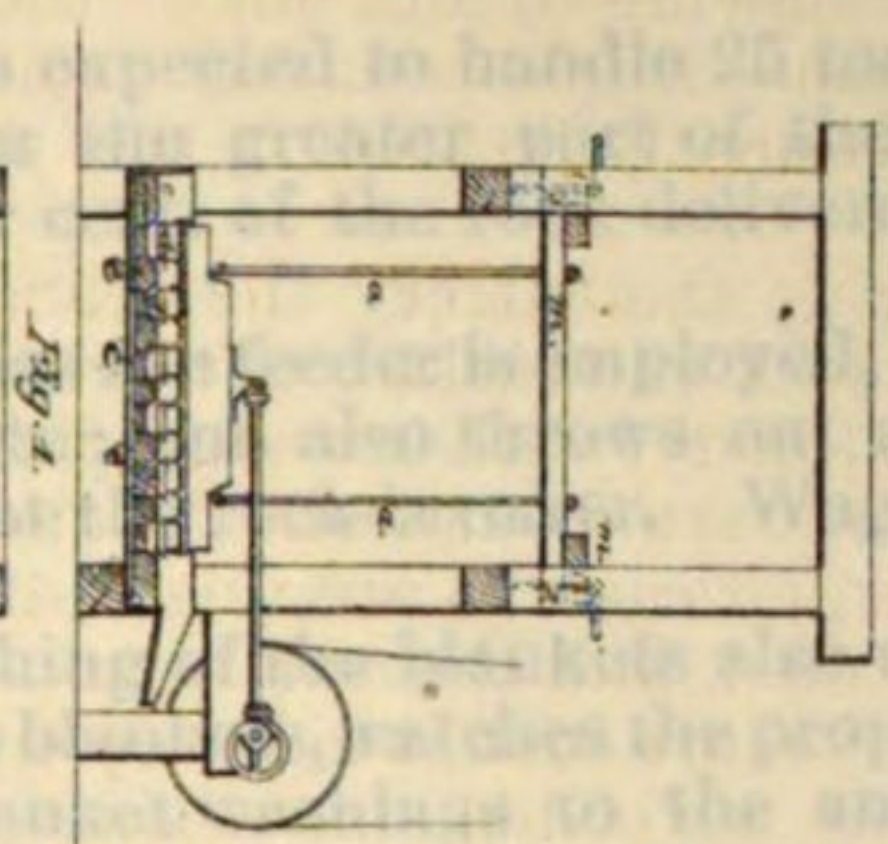
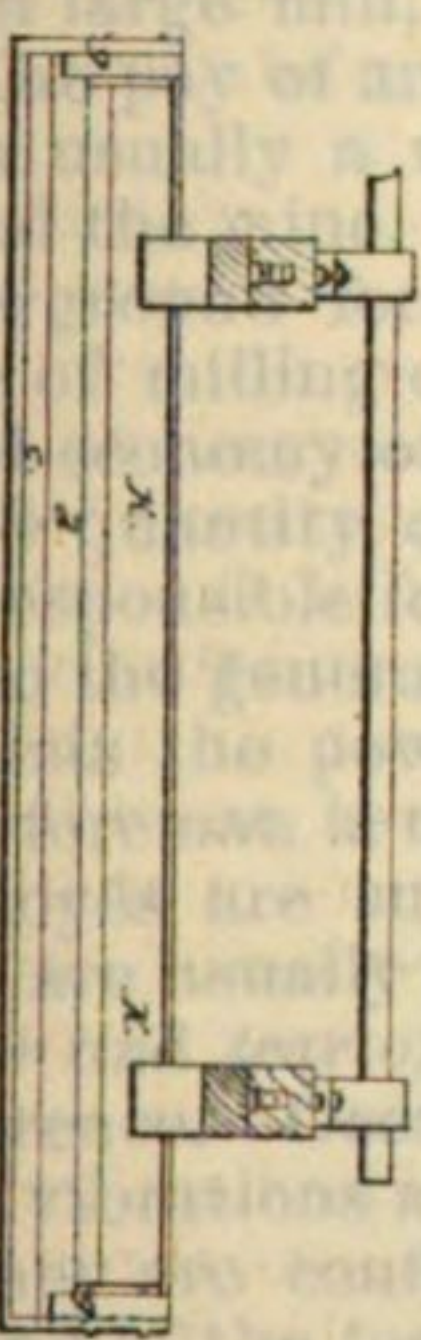


Fig. 1.

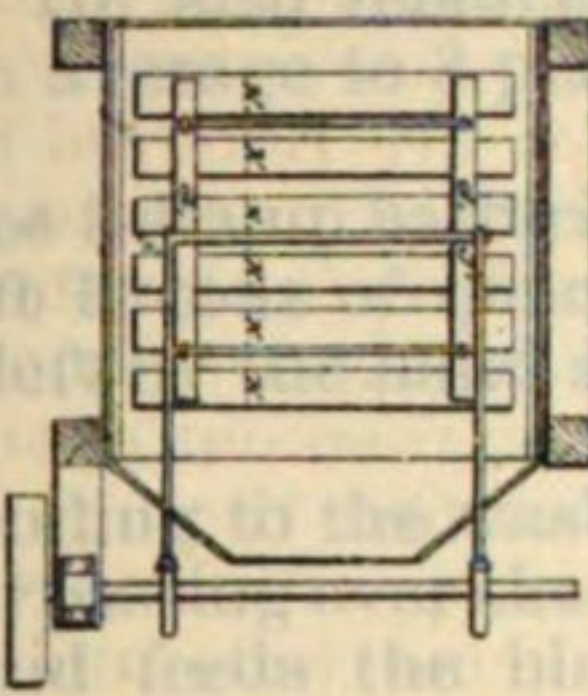


Fig. 1.

Scale of feet and inches.

Fig. 2.



Fig. 3.



(d.) *Workmen in the mill and their duties.*—The labor of attending to the crushing and amalgamating machinery is divided in the following manner:

One man at the rock-breaker is expected to handle 25 tons of rock in a 10-hour shift. He also removes the greater part of the waste-rock, amounting on an average to 3 per cent. of the rock delivered. Wages, \$3 a shift.

For every three 5-stamp batteries one feeder is employed, who handles in an 8-hour shift 12 tons of quartz; and also throws out all the wood and waste rock left by the hand at the rock-breaker. Wages, \$2.75 per shift.

The hand attending to the washing of the blankets also regulates the quantity of water passing over the blankets, watches the proper discharge of the sieves, and feeds the blanket-washings to the amalgamators, while he regulates the flow of water through them. One blanket-washer attends to the blanket-washings of three 5-stamp batteries. Wages for an 8-hour shift, \$2.75.

The attendance upon the amalgamating-machinery devolves upon the amalgamator, who also prepares the screens, attends to the cleaning of worn-out shoes and dies, and various other minor duties in the retorting and melting department. Wages, \$3.50 per 10-hour shift.

When steam is the motor, two engineers attend to the engine and boilers of a large mill, in 12-hour shifts. The wood is brought to the boilers. The pay of an engineer is \$4 per shift.

There is usually a night-watchman, whose duty is divided between the mill and the mine.

The overground foreman, who generally has a thorough practical knowledge of milling operations, is responsible for the regularity, efficiency, and economy of the working of the mill. He sees to the proper quality and quantity of mill supplies, and, together with the amalgamator, is responsible for the proper delivery of the amalgam and battery gold to the general superintendent or manager of the mining property. He has the power of discharging any common mill-hand. The pay of the foreman is usually \$150 per month.

All employes are subject to discharge by the general superintendent. The wages are usually paid monthly.

(e.) *Wear and tear of a mill.*—In a well-managed mill accidents are of rare occurrence. Occasional breakages are unavoidable, considering the strong vibrations and jars to which all parts of the battery are subjected. They are confined to the stems, the shoe-shanks, and screens. The splitting of the tappet by wedging is unfrequent.

A mill requires 130 pounds of quicksilver per stamp. The monthly loss of mercury is $1\frac{1}{2}$ per cent., or 1 pound for every 31 tons of rock crushed. The present value of quicksilver is \$1 per pound at the mill.

The monthly wear of blankets is $1\frac{1}{6}$ yards to the stamp. The cost per yard at the mill is from \$1 to \$1.75.

A 5 stamp battery requires on an average 13 sets of screens a year. A set consists of five sheets of from 1 to $1\frac{1}{4}$ square feet. The cost of screen is 60 cents per square foot.

To run a 30-stamp steam-mill requires from 32 to 36 inches of water, (miners' measure,) *i. e.*, the discharge of an aperture of 32 to 36 square inches under a 6-inch pressure measured from the center of the aperture. The water-charge is 20 cents per inch for a twenty-four hours' run. The water is usually supplied by ditches.

It takes $6\frac{1}{2}$ cords of fire-wood to furnish the steam necessary for a

30-stamp mill. The price of wood per cord varies, with the locality, from \$2 to \$6. At Grass Valley it is \$4.

A shoe lasts from twenty one to forty three days, on an average thirty-three days, crushing 79 tons of rock. Wear, $1\frac{1}{8}$ pounds of iron per ton of rock.

The die lasts on an average seven weeks, crushing 100 tons. Wear, $\frac{6}{10}$ of a pound of iron per ton of rock.

The stem breaks generally square across the fibers near the upper face of the head, and wears, without breaking, about sixty weeks, crushing 864 tons. When the irons are new and of fine quality the breakages are rarer, occurring, perhaps, but once in one hundred and twenty weeks. The rewelding, including the necessary new iron, costs on an average \$10. The stems as well as the cams last at least ten years. The battery-linings wear six months; the tappets from two to three years.

The dies of rock-breakers, weighing 250 pounds each, wear about three months. Wear, one-half of the original weight.

The false pan-bottoms wear one year; and a set of 4 pan-shoes lasts three months.

The cost of a complete mill, including engine and boiler, is usually estimated at \$1,000 per stamp. In a large mill of at least 20 stamps, this includes the concentrating and the chlorination works.

(f.) *Expense of the mill process.*—The following is a tabular statement of the expense of crushing and beneficiating one ton of quartz in a 30-stamp steam-mill, stamps weighing 850 pounds each, with 61 drops of 10 inches; crushing capacity, 72 tons per day:

Steam-power :	
Engineers.....	\$0. 1111
Wood-wheeling to boilers.....	. 0383
Wood.....	. 3636
	———— \$0. 5130
Labor :	
Rock-breaking	. 1250
Feeding.....	. 2292
Blanket-washing	. 2292
Night-watchman, one-half shift	. 0200
Amalgamator	. 0486
	———— . 6520
Management:	
Foreman, one-half salary	. 0400
Manager, one-half salary.....	. 0800
	———— . 1200
Repairing :	
Carpenter and blacksmith, (repair).....	. 0100
Lumber.....	. 0032
	———— . 0132
Supplies:	
Quicksilver	. 0321
Blankets.....	. 0100
Screens	. 0019
Chemicals	. 0054
Hardware and light	. 1031
Lubricating material.....	. 0072
Charcoal.....	. 0020
Hauling and freight	. 0043
	———— . 1660
Water-rent.....	. 0834
Foundry	. 2270
Interest on cost of mill at 1 per cent.....	. 1603
Payment toward repayment of capital invested, per ton	. 0802
Insurance.....	. 0227
	————
Full cost per ton	2. 0378

The full cost of milling one ton of rock, \$2.04, does not include the expense of concentrating the tailings and chlorinating the concentrates.

In a smaller mill, with the same expense of engineers, the milling-expense is, of course, proportionately higher.

When water is the motor a reduction of 80 per cent. can be calculated on the expense of the power, which, for steam, is $51\frac{3}{10}$ cents per ton; 20 per cent. of the expense of steam still remains for the heating up of the water of the amalgamators, &c. This calculation is based upon the supposition that the cost of engine and boilers is the same as that of the water-right, dams, flume, and water-wheel.

The labor-account amounts to a fraction over 65 cents per ton. In this item considerable reductions are contemplated at no distant day, by doing away with part of the labor on the rock-breaker, and by introducing automatic feeding and blanket-washing. This is calculated to be done in the following manner:

1. By introducing screens, consisting of heavy inclined iron bars, which allow the passage of all rock, below a certain size, to the feed-boxes of the battery, while the coarser quartz discharges into a strong hopper-like platform situated over the rock-breaker. Two men per shift would be capable of attending to the whole work on the rock-breaker, consisting in directing the passage of the quartz through the same, besides attending to the adjustment and repair of the battery.

2. Automatic feeding and blanket-washing, though not in favor among mill-men on account of the many unfavorable results obtained by crude and imperfect appliances for the purpose, is still a subject of constant study, and considered a desideratum of a perfect mill. Renewed experiments will be made to prove the economy and efficiency of such devices.

Revolving blankets, discharging the sands into pointed boxes, from which the sands pass in a regular flow into the amalgamators are thought to fulfill the conditions of efficient blanket-washing. The reduction of the labor-account by these means is expected to be fully 40 cents per ton.

The full cost of milling, with the above reductions, would be as follows:

	Steam mill.	Water mill.
Present cost.....	\$2 04	\$1 63
Reduction of labor-account.....	40	40
Reduced cost.....	1 64	1 23

Results of the mill process.—Of the whole amount of gold realized from the sands, after leaving the battery, the quicksilver baths yield $65\frac{1}{2}$ per cent.; the skimmings from the baths and ripples, treated in pans, yield 26 per cent.; the ripples yield 2 per cent.; the rubber yield $4\frac{1}{2}$ per cent.; the copper plates yield 2 per cent; total, 100.

The gold from the battery can be estimated at from 10 to 20 per cent. of the whole amount realized by milling. The longer the run, without a clean-up of the battery, the smaller will be the proportional result of the battery gold.

The concentrates yield from 5 to 10 per cent. of the gross yield of bullion.

Summing up these results, the gold realized by milling and concentrating, is derived from the battery, representing $9\frac{1}{2}$ per cent.; from the amalgamators, representing $85\frac{3}{4}$ per cent.; from concentrates, $4\frac{3}{4}$ per cent.

The fineness of crushing is found to be as follows: The battery sands, crushed through a No. 6 slot screen, contain on an average of:

1. Slimes, which remain suspended, after a three minutes' rest, in still water, 19 per cent. These slimes, which contain when filtered the so-called "float gold," consist principally of the earthy matter, mixed originally with the quartz.

2. Slimes passing through a sieve of 6,400 holes per square inch, (No. 1 excluded,) 51 per cent.

3. Sands passing through 1,600 holes per square inch, (excluding 1 and 2,) 23 per cent.

4. Sands not passing through 1,600 holes per square inch, 7 per cent.

The blanket-washings contain 78 per cent., passing through a sieve of 1,600 holes per square inch, and 36 per cent. passing through 6,400 holes per square inch.

The concentrates of the blankets contain, of course, a larger amount of heavy stuff. The proportion of sulphides contained in the crushed sands, flowing over the blankets to that of the blanket-washings, is as 22 to 100.

To determine the loss of gold by the mill process, a series of assays were made of the tailings of one of the best mills of the State. The following table gives the various results obtained. Each assay, reported in this table, was made in triplicate, and the result given is the mean from the three operations.

*Assays of classified tailings.**

No.		Sample 1.	Sample 2.	Average.
1	Slime, including float-gold, representing 19 per cent. of the pulp.....	\$12 40	\$11 66	\$12 03
2	Slime, representing 51 per cent. of the pulp...	15 70	14 90	15 30
3	Sand, representing 23 per cent. of the pulp....	34 10	22 40	28 25
4	Coarse sand, representing 7 per cent. of the pulp.	22 52	40 18	31 35

The rock crushed paid at the time of sampling \$47.40 per ton, exclusive of the value of the concentrates.

Estimating the yield of the rock in mill at \$47.40, the sulphurets or concentrates at \$2.50, the value of tailings (proportioned average of Nos. 2, 3, and 4,† per assay) at \$16.49, the value of float-gold (see No. 1

* The samples were procured at the end of the tail sluice, and were taken every half hour during a twenty-four hours' run. The buckets were allowed to run nearly full, and the sands were settled exactly three minutes. The water holding in suspension the slime and float-gold, was filtered off on a large paper filter, capable of holding the whole contents of the bucket. The coarser sands, comprising No. 2, 3, 4, were filtered on a separate filter.

† This result is obtained by taking the proper proportions of the different classes, and their value by the above assays, thus:

$$\begin{aligned} 2) & 0.51 \times 15.3 = 7.80 \\ 3) & 0.23 \times 28.25 = 6.50 \\ 4) & 0.07 \times 31.35 = 2.19 \end{aligned}$$

$$16.49$$

above) at \$2.28, we have, as total contents of gold in the quartz crushed, \$68.67, of which \$18.67, or 27 per cent., is lost in the tailings, $3\frac{1}{2}$ per cent. being float-gold. No gold was visible in the above samples.

CONCENTRATION OF THE MILL-SANDS.

The sands after leaving the copper-plates of the mill are subjected to concentration, the object of which is to collect the lost freed gold with the auriferous sulphurets to be treated by a subsequent process.

The concentration consists of the following operations:

1. Sizing the sands by means of pointed boxes, (*Spitzkasten*.)
2. Concentrating the pointed-box sands in sluices with self-raising gate or ripples.
3. Subjecting the concentrated sluice-sands to a further concentration in rockers, buddles, Hendy's concentrators, &c.
4. Treating the buddle concentrates by a more perfect cleaning operation in a tossing-tub.

1. *Sizing of the sands by means of pointed boxes, (Spitzkasten.)*—All concentrating machines work to better advantage when the sands are of uniform size, and pointed boxes are simple and efficient contrivances for sizing. The pointed box is a wedge-shaped wooden box, the lead of which is attached to a corresponding aperture in the bottom of the sluice boxes, carrying off the mill tailings. The length of the box, measured in the direction of the sluice current, depends upon the size of grain desired for the concentrating machine. The shorter the box, the larger the size of grain, (breadth and grade of the sluices or the velocity of the sluice current being the same.)

The sands settling in the box are discharged by a 2-inch iron pipe, communicating with the interior of the box at the bottom, reaching to the top of the water level in the sluice, and provided on the side with $1\frac{1}{2}$ -inch plug-holes, from 4 to 6 inches apart from center to center. The proportion of water to sands is regulated by opening the plug-holes at different depths below the water level, the lowest hole naturally discharging the greater quantity of water with the sands deposited in the box.

When the pointed-box sands are concentrated on two machines, two sizes and, consequently, two pointed boxes are used. The sands, flowing over the first pointed box, pass on over the second, and the slime passing the second box runs to waste.

As the length of the aperture of the box depends upon the velocity of the sluice current, which varies with the grade and proportion of *wet* perimeter of the sluice to its water cross-section, it varies considerably in practice. A length of 24 inches has usually a width of four-fifths of an inch per stamp for the coarser sands, when only two sizes are required. This, however, is only an approximation; as no rule can be given *a priori*, experiment determines the dimensions.

The depth of the pointed box is usually equal to its length, as shown in the accompanying isometrical sketch.

2. *Concentration of the pointed-box sands in sluices with self-raising riffle-gate.*—The pointed-box sands flow through wooden sluice-boxes of a rectangular section, provided at the lower end with a self-raising gate, acting as a riffle, in which the heavier portions of the sands, consisting of sulphurets, black sand, &c., form a deposit near the head, while the lighter particles escape over the gate. For the coarser sands, the boxes have a width of one inch; for the finer sands they are from $1\frac{1}{5}$ to $1\frac{1}{2}$ inches wide for every stamp. They are usually 18 feet long, and have

the natural grade of the sands passing through them. For every two boxes or two sets of boxes there is one riffle-gate. The gate opening is generally seven inches wide and eighteen inches deep. The gate is raised to its full height once in twenty-four hours by means of a horizontal ratchet-wheel, which is keyed to a vertical screw attached to the gate. Two ratchet-wheels, one above the other, are attached to the screw, the teeth of one having the reversed direction of those of the other. By applying a lever arrangement on one side of the vertical screw to one of these, the gate is raised; by applying it to the other on the other side, the gate is lowered. Two boxes 15 to 16 inches wide are filled to a depth of 18 inches by a 15 stamp battery in twenty-four hours. Two boxes or two sets of boxes are used alternately.

3. *Further concentration of the concentrated sluice-sands in rockers and buddles.*—When the sluice-sands are subjected to a further concentration on rockers, they are discharged into a tank, by lowering the riffle gate.

The tailings of the rocker, containing the finer sulphurets, are treated subsequently in buddles, worked either by hand or machinery.

Hand buddles are described in the Mining Commissioner's report for 1870, page 357.

The rocker represented isometrically in the annexed figure consists of a wooden table of 2-inch pine plank, 20 inches wide, and 10 feet long, supported at both ends by wooden rockers, representing a section of a width of 20 inches and depth of about three inches.

The table is enclosed on the long sides and the upper end by 6-inch boards, the lower end being left open for the discharge of the tailings. It has a grade of one inch to the foot, which can be increased, when working coarser sands, by removing some of the supporting scantlings at the lower end, the upper end being fixed stationary by a bolt, which, working in a slot, does not prevent the rocking motion.

The floor of the table, when in equilibrium, is 7 inches above the support.

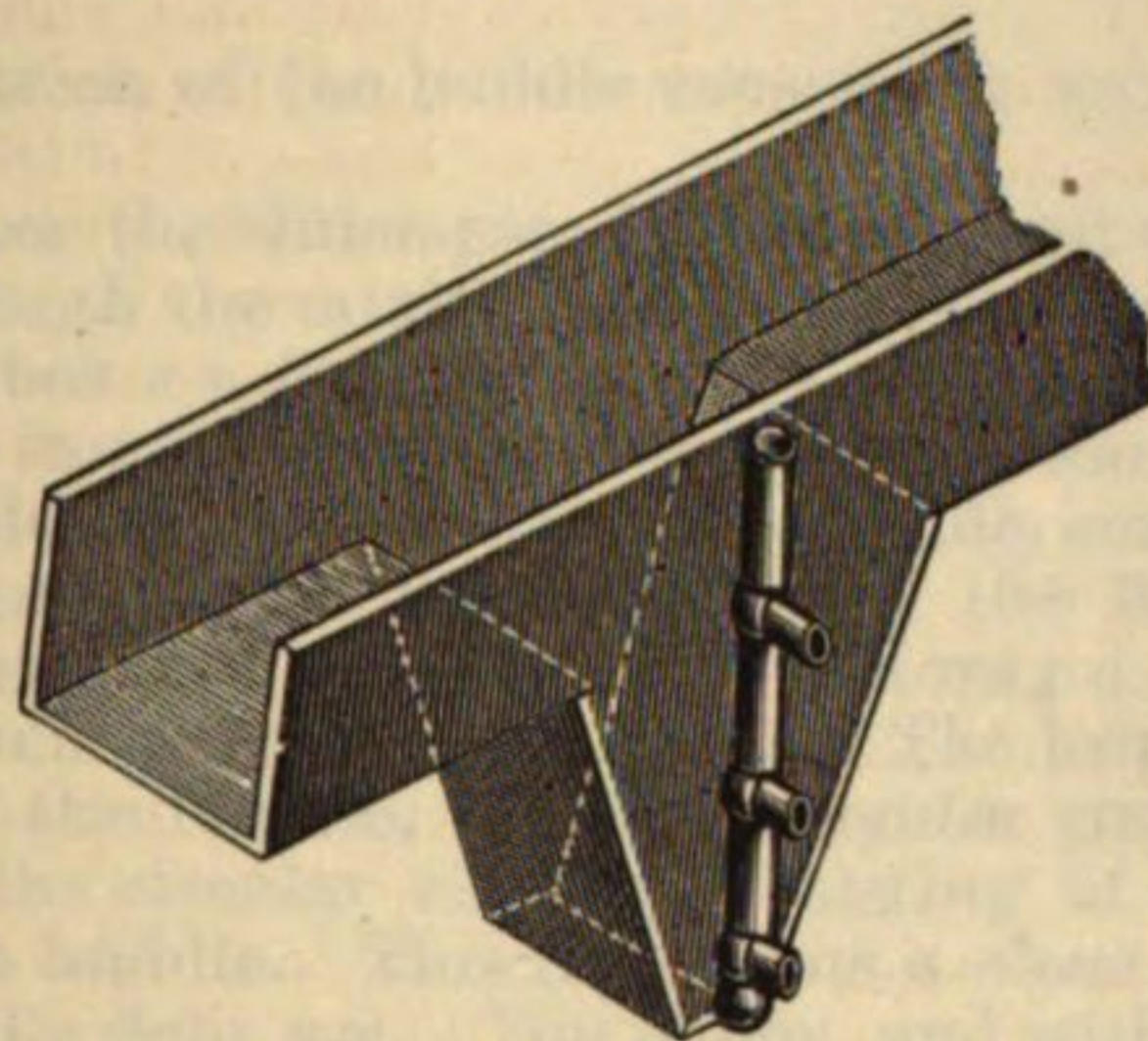
The concentrated sluice-sands are introduced at the head of the rocker in charges of from three to five shovels, (the greater quantity corresponding to the sands poorest in sulphurets,) and a stream of water discharged by a one-inch pipe under a six-inch pressure is turned on the sands by means of a rubber hose. The rocker is set in motion by the left hand of the workman, giving it about 60 strokes of 8 inches a minute. For coarser sands a greater number of strokes is required. The lighter sands gradually work down, while the sulphurets remain nearer the head. With his right hand the workman works the sulphurets up to near the head, with a flat wooden shovel, passing closely along the bottom of the rocker, while the lighter sands pass off. In some mills the rocker receives its motion by machinery. When clean, the sulphurets are removed from the rocker by an iron scoop. One workman can treat about 300 shovels of sand in a 10-hour shift.

The convex buddle is extensively used, and is described in the Mining Commissioner's report of 1870, page 354.

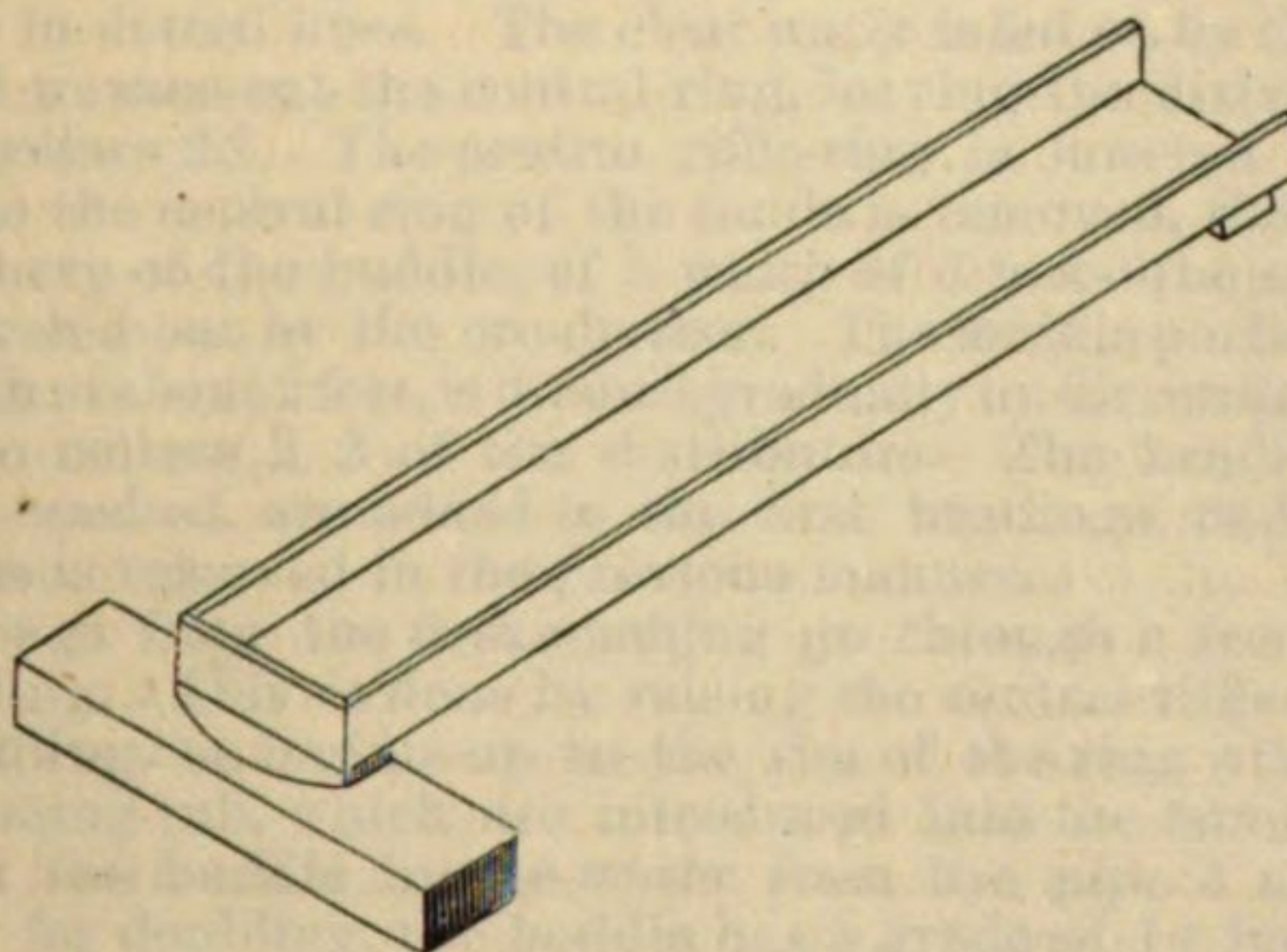
The concave buddle of Paine & Stevens is shown in Plate VI. There are generally two buddles; one for the coarser sluice-concentrates, and the other for the finer. They are of an exterior diameter of 18 to 20 feet, and interior of $2\frac{1}{2}$ feet. The vertical shaft is supported by the wooden block *m*, carrying the journal-box.

Attached to the shafts are:

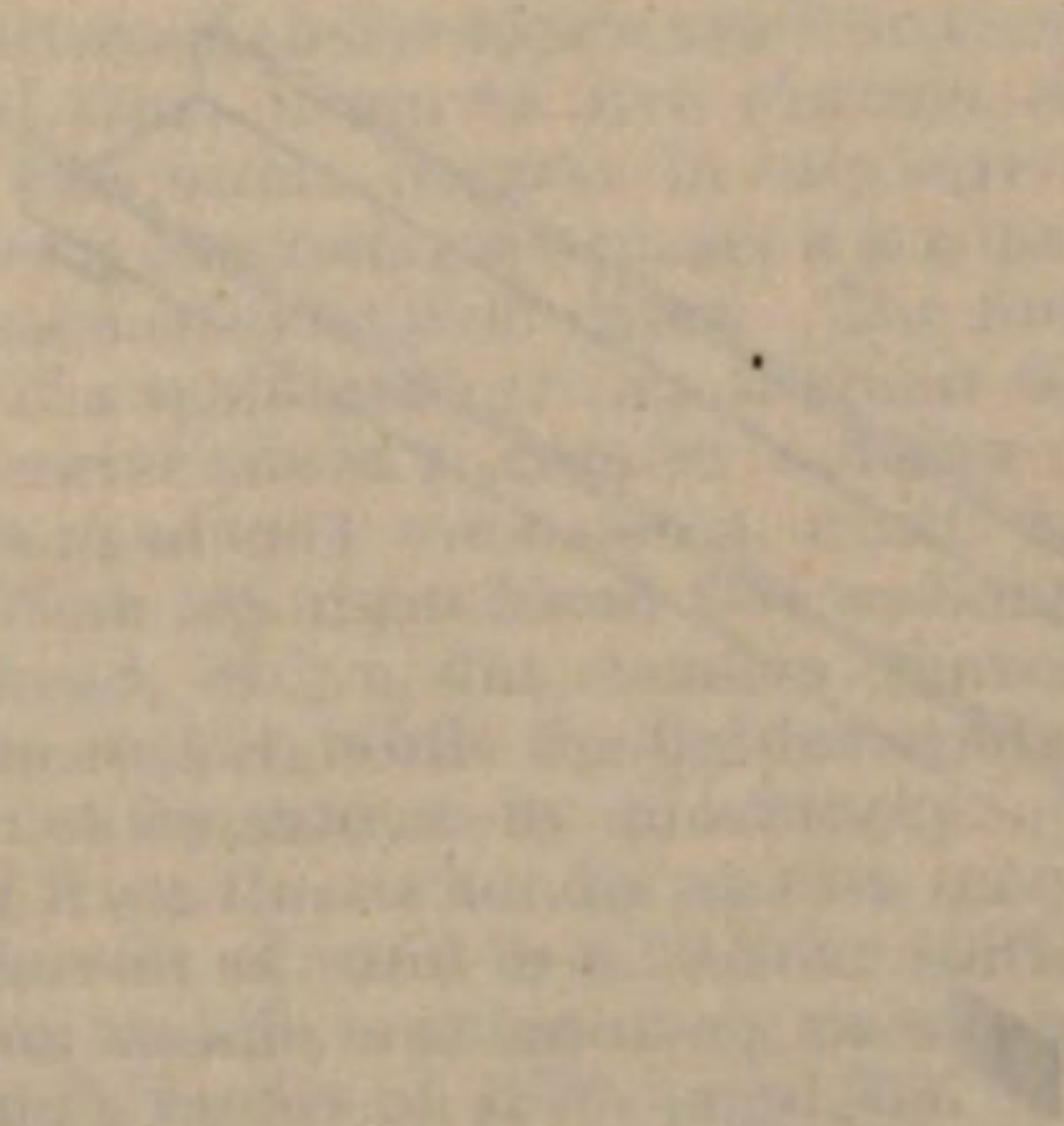
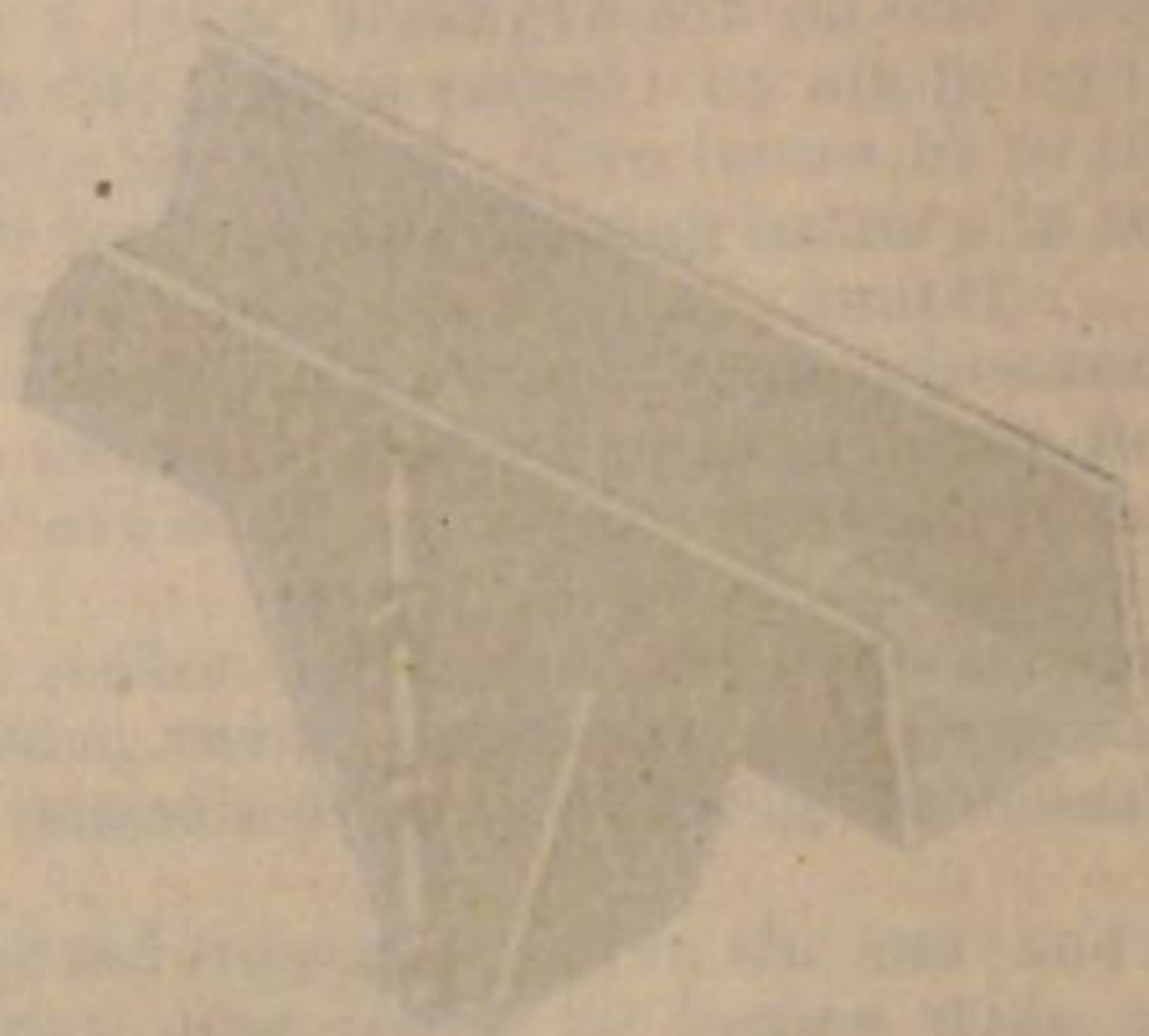
(*a*,) the self-raising riffle-pulley *g*, which is raised by means of a rod, *p*, receiving its upward or downward motion from the endless screw *b*



Pointed box—see p. 333.



Rocker—see p. 334.



and pinion-wheel; (*b*,) the arms *f f*, carrying the brusher; and, (*c*,) the sand-distributing troughs *e e*.

The clear-water box *i* is suspended by the wheels *v v* on an annular flat ring. It is supplied by the stationary wooden box *r*, and discharges the water, by means of the iron pipe *k*, into the sieve-boxes *y* and *z*. The box *s s* is fed by the trough *h* from the mixing-trough *y* and sieve-box *z*. The vertical shaft receives its motion by the pulley *a* and bevel-gearing *d d*.

The first operation of the buddle consists in washing the sluice-concentrates.

For this purpose the sluice-gate is lowered, and the sands are gradually washed through the mixing and sieve box *y* and *z*, and box *h*, into the distributing-box *s s*, from which they are discharged, by the six revolving Russian iron trough-arms *e e*, upon the annular apron *x*. From these they flow down the inclined conical table, constituting the buddle. The arms *f f*, carrying the poles to which the brooms are attached, revolve at the same time with the distributors *e e*. The brooms maintain a regular even surface of the sands. The heavy sulphurets lodge near the head of the buddle, while the lighter particles move on and finally fall over the circular riffle *g*, consisting of an iron pulley, *g*, in the center of the buddle. This ring forms a close joint at the end of the wooden buddle floor *u u*. The pulley, and with it the arms of the broom-poles, are gradually raised as the sands fill the buddle.

When working the coarser ore the time consumed to fill the buddle is six hours; for the finer sands twelve hours are required. The water required by the buddle in washing the coarse sands is 8 cubic feet per minute, spread by the revolving distributors making seven revolutions a minute over a periphery of nearly 63 feet.

When full the sands of the buddle are divided into three concentric rings. The interior ring, of a width of $3\frac{1}{2}$ feet, is considered as waste and washed out. This is done by removing the end-pieces 1 1 of the distributors, and turning the collars 2 2, in the manner represented in the drawing in dotted lines. The clear water is fed on by the stationary sluice *r*, and washes out the central ring, leaving the distributors at the connecting collars 2 2. The central riffle-ring is lowered at the same time. While the central ring of the sands is removed, the outside ring at the periphery of the buddle, of a width of 3 feet—the so-called *headings*—is shoveled out by the ore-dresser. The middle portion left standing, of a width of about 2 feet, is washed gradually by directing the water by means of the collars 2 2 of the distributors. The headings of these sands, when washed, are added to the first headings, and the central ring of sands is removed in the previous manner.

The headings from the first washing go through a second washing, called doubling. This is done by raising the central riffle-ring about 3 inches and filling the buddle up to the rim of the ring with poor sands from the tossing-tub, which are introduced into the mixing-box *y* and washed into the buddle by the water from the pipe *k* and trough *r*. When ready for doubling, the buddle has a grade of $1\frac{3}{4}$ inches per foot for coarse sands and $1\frac{1}{2}$ inches when working the finer sands. All the headings are shoveled into the mixing-trough, which can be brought to any part of the working floor around the periphery of the buddle, being supported on wheels; the distributing clean water-box *i* with water-pipe *k* attached, also revolving on the wheels *u u*, as previously noticed. The time consumed in rewashing the headings of the first washing is generally three hours.

When the operation of washing the headings is completed, the sands

are again divided into three concentric rings. The central portion, of a width of about 4 feet, being removed as before, the outer ring of about 18 inches in width is ready for tossing, while the middle ring, of a width of about 3 feet, is washed down in the previous manner, the headings of it being added to those previously removed by tossing.

The tossing or final cleaning of the sulphurets is usually performed on the buddle-headings, if they are intended to be treated by the chlorination process. This is done in a tossing-tub of the following construction: (See Plate V, Fig. 3.)

The tub, of $1\frac{1}{2}$ to 2 inch staves, is conical in form, tapering toward the bottom, 4 feet in diameter, and $2\frac{1}{2}$ feet deep in the clear.

Through the axis of the tub a hollow cast-iron cone, C, passes, reaching a few inches above the tap of the tub, fastened by a flange to the bottom. A shaft *s* passing through this cone and resting on a journal underneath carries the yoke *l*, to which the horizontal stirrers of flat iron are riveted. Revolution is communicated to the shaft by bevel-gearing *a b*. The hammers are set in motion by the pins *p p*, attached to the vertical bevel-gear, as seen in the drawing. When ready for tossing, the tub is filled to nearly half its height with water, the stirrers are set in motion, making 48 revolutions a minute, and the ore is shoveled in near the periphery of the tub. When nearly full, the yoke is lifted out by means of a rope and pulley overhead, and the sands are allowed to settle while the hammers are set in motion, making 96 strokes each a minute to facilitate the rapid settling of the sulphurets and sands. When the sands have settled the water is drawn off by an iron siphon; the skimmings are removed to a depth of 2 inches and thrown out as waste. The upper half of the sands remaining are retossed, and the resulting sands above the sulphurets washed again in the buddle during doubling. The lower half of about 5 to 6 inches, consisting of sulphurets sufficiently concentrated, is delivered at the chlorination works to be further treated for gold.

Two buddles working the sands of a 30-stamp mill require the attendance of three men at \$3 per day.

The manual labor of concentration by this method, leaving out of consideration the expense of power, interest on money invested, and wear and tear, is $12\frac{1}{2}$ cents per ton of quartz crushed.

The riffle-boxes, and also, to some extent, the concave buddles, lose a considerable proportion of coarse sulphurets. To reduce this loss, the tailings from the buddle and riffle-slucies pass through a long string of sluice-boxes supplied with wooden riffles of a square section of $\frac{3}{4}$ of an inch, which are washed every Sunday when the mill stops, into and through a wooden box about 5 feet wide, 10 feet long, and 3 feet deep. The box is open at the lower end. The heavier sulphurets form a deposit at the head, and these headings are treated by the rocker.

When concentrating by means of riffle-slucies, concave buddles, and rocker for buddle-tailings, the loss in sulphurets is $12\frac{5}{10}$ per cent., treating quartz sands, containing one-third of one per cent. of sulphur, or its equivalent in sulphurets.

Hendy's concentrators, described in the Mining Commissioner's report of 1870, page 699, take the mill-tailings usually without previous sizing or concentration in self-raising riffle-boxes. The tailings of the machine, when the value of the resulting concentrates permit, are buddled.

Good concentrating machines, working with the least loss, and little or no manual labor, are still a desideratum in California.

Rittinger's lateral percussion tables have not given favorable results, on account of the loss of the coarser, globular sulphurets of iron.

Experiments will be instituted shortly to try the continuous-working jiggers used in the Zellerfeldt mill No. 40, at Clausthal, for the coarser sands, and the revolving slum-tables for the finer sands or slimes.

III.—CHLORINATION OF THE CONCENTRATES.

The concentrated sulphurets or arseniurets are subjected to a treatment by chlorine gas, after a thorough oxidizing or chloridizing roasting.

The chlorination works are located with reference to the prevailing winds, the fall of the ground, and the ready supply of clean water. As the sulphuric acid and chlorine vapors are destructive to the machinery of the mine and mill, every care is taken to select a location for the furnace from which they cannot be carried to the mill by the prevailing winds. The direction of the draft is also in that of the winds. For the proper and economical working of the process a fall of at least 30 to 40 feet is required. The water supply, of at least 35 gallons per hour, is discharged into a wooden tank, which will hold a twenty-four hours' run. The top of the water is never below the level of the hearth-surface of the finishing furnace.

The concentrates are usually delivered in sacks, or, better, in dump-carts, at the ore-floor of the chlorination works, on a level with the charging hopper of the upper furnace. The concentrates contain on an average 6 per cent. of moisture.

The following analyses represent the general constituents of the concentrates:

	Eureka and Idaho, Grass Valley.	Washington mine, Mariposa County.	Black Bear mine, Klamath County.
Copper	0.85	0.00	0.00
Lead	0.78	1.50	.....
Gold	0.02743	0.00914	0.0137
Silver	0.0068	0.0035	0.003
Zinc	0.00	1.34	.....
Iron	40.65	30.85	42.05
Arsenic	Trace.	0.00	21.25
Sulphur	32.80	31.33	25.10
Silica	12.64	33.30	10.35
Alumina	0.10	.....	0.85
Magnesia	3.50	.....	.....
Oxygen and loss by difference.....	8.65	1.67	0.38
	100.00	100.00	100.00

Roasting of the sulphurets.—The sulphurets are roasted in double and treble terrace drop-furnaces. The upper is a continuation of the lower furnace with a vertical flue or chimney about 10 feet in height between the hearths through which the ore falls on its way to the finishing hearth. This flue or chimney is introduced to aid the roasting of the ore by bringing it, when heated to red heat, in contact on all sides with the oxydizing and chloridizing gases of the finishing hearth, while falling in a fine spray.

1. *Construction of the furnace.*—A solid dry foundation is indispensable for a furnace. If good and cheap stone can be procured, the furnace is built of that material to near the fire-line. The stone walls require to be at least 2 feet thick; the interstices between the stones are filled with small stones and coarse clay mortar. The whole of the furnace above the fire-line is constructed of common red brick, laid in clay mortar. Enough sand is mixed with the clay to make it "lay well," or leave the trowel properly. No fire-bricks are necessary. All the walls are one brick thick, with the exception of the spandrel walls, up to the extrados of the arches, which are two bricks thick. The small sides of the drop-flues have also a thickness of two bricks. The front wall, which incloses the fire-grate, has a thickness of one and a half bricks.

A furnace constructed of red common bricks, laid in clay mortar, lasts at least four years; the upper furnaces, at least two years longer. In repairing, 6,000 new bricks and thirty shifts of bricklaying will restore the furnace again to its former condition.

The horizontal section of the lower finishing furnace measures on the outside 14 feet in length and 12 feet in width. The back furnace adjoining has a horizontal section of 6 feet in length by 12 feet in width. The drop flue is 12 inches long at the lower end and 10 feet 8 inches wide, the latter measurement parallel to the fire-bridge. It is contracted toward its upper end, and is 4 inches long by 10 feet in breadth at the upper hearth. A few inches below the upper hearth two iron damper frames are walled into the front or door-wall, the gates of which slide horizontally and allow the regulation of the draft of the lower furnace.

The upper furnace measures 13 feet 4 inches in length by 12 feet in width, outside measurement. The whole of the upper hearth is supported by a semicircular arch. The space underneath the arch serves for the working of the back hearth of the lower furnace, through the back doors. The inside wall of the vertical flue, which acts as a retaining wall for the clay filling over the arch, is also built in the form of a very flat arch and strongly tied with $\frac{5}{8}$ -inch iron rods passing through the uprights on the outside of the furnace-walls.

The inside section of the upper chimney is 16 by 20 inches, but usually reaches 4 feet above the ridge-pole of the roof. A damper regulates the draft of the same.

The grate is 16 inches wide and 8 feet long. Its surface is from 4 to 6 inches below the hearth line. The fire-bridge is one brick wide, the bricks in the same being laid as row-locks. The top of bridge is 8 inches above the hearth, and 12 to 14 inches above the grate-surface. The cast-iron fire-door has an opening of 14 by 12 inches. The hearth surface, 3 feet 6 inches above the ground floor, has a section of 11 by 11 feet, diminished, however, by projecting points of brickwork between the doors, of which there are two on each side of the furnace. This brickwork fills out the dead spaces which cannot be reached conveniently with the rakes or scrapers by the roaster.

On one side of the furnace, in front of one of these projecting points in the middle of the hearth, the discharge hole is situated; it is 8 by 8 inches and closed with an iron slide, the frame of which is firmly walled in between the hearth and the arch of the ore-vault which supports the hearth.

The center line of the ore-vault is vertically under the center line of the hearth, parallel to the fire-bridge. The ore-vault is 4 feet wide in the direction of the draught, 6 feet long, and open toward the cooling floor of the impregnation-room. The floor of the vault is provided with rails for the ore-car, made of boiler iron. The hearths of the furnace consist of

hard bricks laid edgewise, the section of 2 by 8 inches upward. For this purpose the dry clay is firmly bedded and dry sand spread over the same, leveled and settled by pounding. The bricks are bedded dry, with the long sides in the direction of the movement of the working scrapers. When completed, dry sand is spread over the surface and thoroughly worked into the cracks. The surface is finally smoothed off by settling the bricks by blows on a heavy wide plank laid over them, and grinding the same, with the addition of sand, by means of a brick.

The working-openings are 12 inches wide and 6 inches high. Cast-iron frames with sides sloping toward the interior and exterior, protect the brick-work. The inside boxing of the frame, which is exposed to the wear of the working-rakes, can be readily replaced when worn out. The bars on which the rakes are worked are 6 inches above the hearth-line. The arch over the lower furnace abuts against the working-sides, and a part of the skew-back is supported by the upper flanges of the working-doors. To fasten them firmly into the walls it is therefore only necessary to screw or key them against the skew-back by means of tension-bars and vertical uprights, which firmly tie the furnace.

The tie-rods of $\frac{5}{8}$ -inch square iron are provided with eyes for the reception of the wrought-iron uprights $\frac{3}{4}$ by $2\frac{1}{2}$ inches in section, which are keyed up to the brick-work. Three parallel wrought-iron bars $\frac{3}{8}$ by 1 inch in section, running along the skew-backs on both sides of the furnace, transfer the pressure of the arch through the uprights to the tension-rods, preventing a sliding out of the skew-backs of the main arches. The main arches are 8 inches thick and have a rise of at least $\frac{1}{10}$ of the span. After "decentering," a good arch of common bricks and clay mortar will settle about 3 inches in a span of 10 feet 8 inches.

The center line of the main lower arch is 22 inches above the surface of the finishing-hearth at the back doors; at the fire-bridge, the skew-back line being four inches higher, it is 26 inches above the same. From near the back door of the finishing-furnace the arch rapidly descends, and the section at the back hearth is contracted as much as circumstances permit.

All the arches are built on wooden centers of $1\frac{1}{2}$ -inch pine boards, which can be taken out and used again. Most of the patterns have a span of 128 inches, a rise of nearly 13 inches, and a radius of 168 inches, (equal to 1.3 times the span.) They are set from 2 feet to 2 feet 8 inches apart, on three frames, consisting of sills, posts, and caps, placed on the hearth, parallel to the direction of the draught. For the arch of the finishing-furnace the strips covering the centers are 4 to 6 inches wide and 14 feet long. They must be thin, say $\frac{1}{2}$ inch thick for the part of the arch behind the back working-door, to suit the curve of the arch. For all other arches, 1-inch strips 6 inches wide are suitable, while the centers can be set further apart.

The measurement of the back hearth in the clear is 9 feet 4 inches in width, by a length of 5 feet 4 inches. It is from 4 to 6 inches above the finishing-hearth. The arch is 26 inches above the hearth, and its rise is one tenth of the span, as usual. The two working-openings of the back hearth are opposite the fire-bridge, and their lower edges are 8 inches above the hearth. The cast-iron frames of the working-doors of the back furnace, having an opening of 6 by 10 inches, are provided with cast-iron doors. Wherever the tension rods pass through the flue they are surrounded by iron pipes, passing through the brick-work, to protect them from the oxidizing influence of the hot gases. A sediment of rust and ore-dust soon forms a thick envelope around them, effectually preventing any further oxidation. The portion of tension-rod passing

through the flue has double the section of the balance. No weldings are allowed on the tension-rods; all connections have to be made by hooks.

The upper hearth has a length of 11 feet 8 inches by a width of 10 feet 8 inches. The center of the arch is 26 inches above the floor, and has a rise of one-tenth of the span abutting against the long side of the furnace. The skew-back is secured in the same manner as that of the lower furnace. The working openings and doors, of the same pattern as those of the back hearth of the lower furnace, are on the front or chimney-flue end, and on the back end of the furnace. The working-floor for the front doors is suspended from the roof over the lower furnace.

The ore is charged into the furnace by means of a hopper of boiler-iron, supported by strong beams. The top of the hopper is on a level with the ore-floor. When the yield of the sulphurets warrants the outlay, a dust-chamber is attached to the furnace, which saves on an average $1\frac{1}{2}$ per cent. of the gold contained in the ore.

The grate-bars are of $\frac{3}{4}$ by 2 inch wrought iron, 4 feet long. They are kept apart at the proper distance by rivet-heads $\frac{3}{8}$ inch high, fastened to them at both ends and in the center. They are well supported by cross-bars bedded on boiler-plates in the wall to keep them from sagging. They last, when well taken care of, several years. A set consists of 32 bars. The working-bars or scrapers are of $\frac{3}{4}$ -inch round iron, 9 feet long. One end is provided with a handle, while to the other a cast-iron plate 4 by 8 inches is attached. The plate, $\frac{3}{4}$ inch thick, is riveted to a heavy T-piece on the end of the bar.

2. *Working of the furnace.*—The charge of a furnace, in a sound working condition, consists of $5\frac{1}{2}$ to 6 tons of concentrates, viz, one ton in the finishing-furnace, $1\frac{1}{2}$ to 2 tons in the back hearth, and 3 to $2\frac{1}{2}$ tons in the upper furnace. There are two men working one furnace, the head roaster and his assistant.

When the finishing-hearth is discharged, the iron slide of the discharge-hole is closed and some rag or woody fiber or bark is introduced into the square discharge-hole with a long-handled shovel, to prevent the caking of the ore on the slide. The hole is now filled with old ore slightly moistened, and leveled up with the top of the hearth, to prevent any new and unroasted ore from lodging in the discharge-hole.

The assistant pushes the ore of the back hearth from the back doors into the finishing furnace, and the head roaster spreads it evenly over the floor of the same.

The imperfectly roasted ore consists now of metallic oxides, sulphates of the alkaline earths, and also a small percentage of sulphides. The heat in the back hearth and in the drop-flue has already decomposed the iron and copper sulphates. The ore is now at a dark-red heat. A charge of one ton being made, the roaster cleans the grate and increases the heat to a bright redness by steady firing. The fuel consists of cedar or spruce, rarely of pine. When the ore, suddenly started with the working-scrapers, shows in falling only a few sparks, which the roaster must be capable of counting, it is ready for the salt, and the chloridizing roasting begins. This is generally the case after a preliminary roasting in the finishing-hearth of from three to four hours. Every ore is benefited by the use of salt for the finishing roasting, as the consumption of chlorine in the subsequent impregnation is reduced thereby, aside from the advantage of a purer precipitate of gold by the proto-sulphate of iron. To some sulphurets only 5 pounds of salt per ton are added for the chloridizing finishing operation; others require 90 pounds for the same quantity.

When a larger amount of salt is required, on account of the presence of a greater quantity of lead to be removed, the roasted ore has to be lixiviated to remove the coating of soluble sulphates and chlorides remaining, previous to treating it with chlorine. With the usual smaller quantity of salt this operation is unnecessary, as the water used in dampening the roasted ore appears to dissolve this alkaline salt envelope sufficiently to give the chlorine an opportunity to act upon the gold. On an average, only 56 per cent. of the salt is decomposed.

The reaction of this salt in the absence of any sulphates of iron or copper, according to Plattner, is the following: Cu_2S and Fe_2S , with air and salt, form sulphurous acid, and by contact with red-hot ore sulphuric acid, which, reacting upon the salt, sets the chlorine free, forming chlorides. When lead is present, the reaction of the salt upon the sulphate of lead in melting produces sulphate of soda, volatile chloride, and oxychloride of lead.

During the finishing roasting, the ash-pit is kept closed, while the necessary air has access through the working-doors. The draught is so regulated by the dampers in the drop flue that but few vapors escape at the back door of the finishing-furnace. The ore is worked systematically in the finishing-furnace. First, it is raked and pushed entirely to one side, then entirely to the other, clearing the middle carefully in every case; then it is piled up in a ridge in the center and cut down from both sides with the rakes. This procedure is continually repeated. When the ore will maintain a vertical face, shows no brighter specks on its glowing surface, is inclined to become black, and cool very readily, which generally takes place from seven to seven and a half hours after the charging, it is ready to be discharged. The iron discharge-slide is now removed; the ore filling out the square discharge-hole in the hearth is forced out with the rake and made to fall into an iron bucket. The remnants of the ore, lodged in the discharge-hole, are carefully removed from underneath the ore-vault. The ore, having been previously piled close to the discharge-hole for a speedy removal, is pulled by the roaster and his assistant into an iron car, holding one ton of roasted ore, and dumped into the coolers. When well roasted, the ore gives abundant white fumes on testing with ammonia. Not until the introduction of the salt in the finishing furnace is the assistant allowed to rake down a charge from the upper furnace.

The discharging or dropping of the ore into the back hearth has to be done slowly, so as to give the ore the greatest possible advantage from the chloridizing influence of the heated gases. The best results are obtained and the least chlorine gas is consumed in the subsequent impregnation, when but a slight violet-colored flame is produced by the falling of the ore. When the sparkling of the ore is very lively a larger quantity of salt than usual has to be added in the finishing roasting.

When the back hearth is well filled with ore, the sulphides in the upper furnace are moved forward and a fresh ton is charged at the end of the furnace through the iron hopper. The upper furnace is kept as full as possible. When the ore is less advanced in roasting, the damper of the upper chimney is drawn out and *vice versa*.

The heat is high enough in the upper furnace to decompose all sulphates of iron and copper when they arrive near the drop.

3. *Impregnation of the roasted sulphurets.*—A furnace roasting 3 tons a day is provided with a dumping-space or cooler of at least 300 square feet. The cooler consists generally of a brick floor, enclosed with a rim of $\frac{1}{8}$ -inch boiler-plate 18 inches high, held in position by wooden uprights on the outside. When the ore is not thoroughly cooled, before treatment

by chlorine, a greater consumption of gas is the consequence, aside from the smaller percentage of gold extracted.

Well roasted sulphurets rarely contain more than $1\frac{3}{8}$ per cent. of sulphur in the unoxidized state. The quantity of sulphates in the ore varies of course with the amount of alkaline earths in the original ore and the alkali added in roasting.

A ton of roasted ore occupies on an average $24\frac{1}{2}$ cubic feet, and is derived from 2,800 pounds of raw sulphurets, occupying about $13\frac{2}{3}$ cubic feet per ton; or, what amounts to the same, a ton of sulphurets weighs after roasting only about 1,450 pounds, occupying $17\frac{1}{2}$ cubic feet. The impregnation vats usually employed have an inside diameter of 7 feet, and are made of 3-foot staves, 2 inches thick, of the best split sugar pine. They are coated with a plastic mixture of pitch and tar. Previous to using them for the first time, all vats are thoroughly soaked with water, to avoid any loss of gold by impregnation. The false bottom consists generally of quartz pebbles, but fine sea-shells (consisting of carbonate of lime) have been used to advantage without any prejudicial result. Talcose rocks, and particularly silicates of alumina, have to be avoided, on account of their power of absorbing the chloride.

When the vats are ready for a charge, 15 small buckets of dry ore are first spread over the false bottom and allowed to draw the water from the same. The ore is then raked together with a hoe and scooped up into the sieve, having 16 holes to the square inch, through which it is made to pass, to give it a uniform dampness and light texture. If too wet, a sufficient quantity of dry ore is added. When it is of the proper dampness, the balls of ore, compressed by the hand, are just able to crumble up again. Should this be neglected, the cake of wet ore over the false bottom would prevent the easy passage of the gas through the same, and would cause a great increase in the consumption of gas. Even the whole of the usual charge of gas may be consumed by this neglect, never rising but a few inches above the bottom.

The ore is kept somewhat drier near the bottom, as it always draws an additional quantity of water from the latter. When the ore is too dry, the gold is not attacked with energy; when too wet, the chloride-water forms an envelope around the gold, which is not as powerful a solvent as the gas itself. The finer the ore, the smaller the quantity of water which can be applied.

The remainder of the coal-ore or charge is sprinkled with clear water from a hose and raked together to be scooped into the sieve by a bucket. The sieve slides on rollers on an iron-plated scantling, placed across the vat.

When the vat is filled within 6 inches of the top, the surface of the ore is made to form the shape of a saucer, higher on the sides, with a flat circular space in the middle. The cover is lowered and the rim closed with dough.

When the gas shows itself on the surface the spy-hole in the rim is closed; and a lively current of gas through the lead pipes, kept up during two hours additional, finishes the operation. From five to eight hours is the usual time required for the impregnation.

The gas necessary for a 3-ton charge of refractory ore is generated in a lead gasometer 20 inches diameter and 12 inches deep. The cover is made gas-tight by a water-joint, 2 inches deep, as are also the stirrer and escape-pipe of the gas. The acid is introduced through a bent lead pipe. The charge of the gasometer for 3 tons of ore consists of 20 pounds of coarse rock-salt, 15 pounds of binoxide of manganese, containing 70 per cent. of mining ore, and 35 pounds of oil of vitriol of 66° Beaumé; to which are added 18 pounds of water. When necessary,

the quantity of acid is increased to a maximum of 45 pounds, the water to 23 pounds. The water is not introduced until the acid is wanted. To every pound of acid, half of a pound of water is added. One stick of 4 foot cordwood, cut up, is sufficient to generate the heat, required by the gasometer for one impregnation.

4. *Lixiviation of the impregnated ore.*—The roasted ore is allowed to remain in the gas about forty hours. Of the three impregnation vats, each is filled every fourth day. The filtering and emptying is done every third day. On the morning of the third day, the cover is lifted. The presence of a strong odor of gas is a sign of good work. The surface of the ore is covered by a stream of clear water discharged by a 2-inch iron pipe under an average one-foot pressure. Care is taken to prevent, as far as possible, the rushing down of the water on the sides of the vat. When all the gas has escaped which is not absorbed by the water, the faucet is opened. The clear yellow solution, frequently having a strong odor of chlorine, runs through a canvas bag into a barrel of about 18 inches diameter and 2 feet depth. Into the side of this barrel, 2 inches from the bottom, a conical wooden tube is driven, with the small end outside, over which the rubber hose of one-inch inside diameter is slipped. The gold solution is carried off through the rubber hose to the precipitating tanks. The small quantity of ore and sand escaping with the solution is deposited in the canvas bag.

The following analysis of a gold solution, taken one minute after the opening of the faucet, is from ore yielding \$163 per ton, the charge amounting to 3 tons:

500 c. c. deposited after twenty-four hours settling, contained—

Sulphate of lead	4.16 grains.
Silica	0.24 “
Sulphuric acid	325.10 “
Chlorine free and combined	371.70 “
Gold	6.77 “
Copper	3.75 “
Iron	0.14 “
Alumina	3.93 “
Magnesia	40.85 “
Soda	470.64 “

Total in solution	1227.28 grains, equivalent to
Al ₂ O ₃ , SO ₃	6.98 grains.
Mg. O., SO ₃	132.55 “
Pb. O., SO ₃	4.16 “
Na. O., SO ₃	426.62 “
Au. Cl ₃	10.44 “
F ₂ . Cl ₃	0.32 “
Cu. Cl	8.95 “
Na. Cl	536.00 “
Silica	0.24 “
Free chlorine by difference	101.02 “
	1227.28 grains.

500 c. c. evaporated to dryness gave 1124.3 grains, agreeing closely with the above total, less 101.02 grains of free chlorine.

When the ore contains lead, the soluble chloride is transformed into the sulphate by sulphates present, and gives the gold solution a milky appearance. A great part of the sulphate is left in the canvas bag,

which has to be frequently cleaned. After a run of some time this difficulty ceases with the exhaustion of the sulphate in the solution.

The gold solution is made to run into the precipitating tanks in a tangential direction, which gives the liquor in the vat a rotary motion, facilitating the coagulation of the gold particles and their subsequent settling. It also causes a thorough mixture of the gold solution with the precipitant.

The precipitating tank of the same material as the impregnation vats is $5\frac{1}{2}$ feet in diameter and of 3-foot staves. It receives a smooth finish inside to allow a perfect cleaning. No inside coating is applied. It is set perfectly level to avoid loss of gold while running off the waste-liquor. The precipitating solution of the proto-sulphate of iron is introduced into the precipitating vats at the beginning of the filtering operation. Care must be taken not to introduce a wasteful quantity. It is better to make up the deficiency when the vat is nearly full.

Two vats, one $5\frac{1}{2}$ the other $4\frac{1}{2}$ feet diameter, hold the solution from very rich ore. Generally only the larger vat is required.

When the solution from the impregnation vats ceases to give the gold re-action with proto-sulphate of iron the water is drawn off the impregnation vats. The ore is shoveled out through an opening in the side of the impregnation room and washed off by a current of water. The ore has to be carefully removed from the false-bottom so as not to injure it. The vat is now ready for the next morning's impregnation. Every day one vat of ore is impregnated; the second remains in the gas, and the third is filtered and emptied.

5. *Collection of the gold precipitate and final operations.*—The gold settles over night. The supernatant liquor is drawn off by opening the plugs in the side of the vats, the lowest one of which is on a level with the bottom. The gold is finally washed into a common wash-tub by means of a hose and pipe, with the smallest possible quantity of water.

The precipitate obtained is treated with a mixture of sulphuric acid and salt to free it of oxides and basic iron salts. For this purpose a handful of salt to 5 pounds of oil of vitriol is used. By stirring the reddish color of the precipitate changes to the brown-gold color, and the particles of gold coagulate, forming generally a ball of precipitate, which is squeezed in a cloth to free it from liquor. When a greater quantity of impurities are mixed with the gold, the precipitate does not ball.

The precipitate is filtered, dried in cast-iron retorts, and smelted with salt, sand, and saltpeter, in sand crucibles.

The general average fineness of the gold-bar is .960; the remaining .040 consisting principally of iron and lead.

6. *Expense of the process.*—The following table shows the expense of the process, with facilities of working three tons a day:

	Expense per 3 tons.	Expense per ton.
Expense of roasting:		
Two shifts on upper furnace, at \$1.50 per day, Chinese labor	\$3 00	14 60
Two shifts on lower furnace, at \$2.75 per day, white labor	5 50	
One and two-tenths cords of cedar wood, at \$4 per cord ..	4 80	
Salt, 50 pounds, at \$8 per ton	20	
Freight on salt at \$12 per ton	30	
Wear and tear on working-scrapers	30	
Wear and tear on furnace	50	\$4 87

	Expense per 3 tons.	Expense per ton.
Chemicals at San Francisco:		
Salt, 20 pounds, at \$8 per ton	\$0 08	1 93
Manganese, 15 pounds, at \$60 per ton	45	
Oil of vitriol (66°) 35 pounds, at 4 cents per pound....	1 40	
Expense of impregnation:		
Freight on salt and manganese, 35 pounds at \$12 per ton..	21	5 86
Freight on acid, 40 pounds, \$3 per carboy of 165 pounds...	64	
Freights on chemicals to works	85	
Expense of carboy, per 40 pounds of acid, carboy returned..	32	
Labor at vats, \$2.50 per day	2 50	
Flour	06	\$1 95
Wear and tear on buckets and hose	20	
Precipitation and melting of gold:		
Acid for precipitating liquor, 16 pounds	64	1 98
Freight and expense of carboy	68	
Old wrought iron	06	
Charcoal, crucibles, fluxes	60	2 00
Management	6 00	
Interest on cost of works, \$3,000 at 1 per cent.	1 20	
Payment towards the sinking-fund	2 40	80
Fire insurance	1 20	40
Full cost	33 24	11 08

It appears from the foregoing table that the principal expense of the process consists in the roasting, the cost of which is \$4.87 per ton, while the chlorination proper, costing but \$2.21 per ton, can scarcely be excelled in cheapness by amalgamation.

The full cost of working sulphurets, when a steady supply of ore can be procured, does not exceed \$11.10 per ton.

By adopting Bruckner's revolving cylinder furnace for the finishing roasting, in connection with a drop furnace for the preliminary roasting, a considerable saving may be effected. Stetefeldt's furnace is not thought to effect as perfect a roasting of highly sulphureted ore as is required for the chlorine process; at least, the drop furnaces in use in California, constructed by the writer—some of them with two 10-foot drops—do not approach the perfection required of the finishing roasting for the Plattner process. An additional finishing hearth is invariably required.

7. *Results of the chlorine process.*—In most sulphurets some coarser particles of gold are found, which are not entirely extracted by the chlorination. This gold can be readily caught by allowing the tailings to run in a regular current over quicksilver riffles, such as are used in the mill. The amalgamation of the gold is effected with remarkable facility.

The loss of gold by Plattner's chlorine process amounts to less than 5 per cent.

By using the amalgamating appliances this loss is still further reduced.

INFLUENCE OF THE VELOCITY OF IMPACT ON THE EFFECTIVE DUTY OF STAMPS.

It is well known that but a fraction of the mechanical work expended in lifting stamps, is usefully employed in the fall, also that the value of

this effective fraction varies between wide limits.* The total amount of power developed in the fall, may be divided into two portions: first, that usefully expended in actual crushing; second, that which is wasted, in jarring the foundation and in heat. The heat is produced both by friction and by force of compression, not expended in fracture.

The most economical work would be performed when the blow is exactly sufficient to crush the rock with a minimum of jar communicated to the mortar-bed. A fragment of rock may be just strong enough to resist the blow of a stamp; the whole force of the blow will be transmitted through it to the foundation. A slightly harder blow, or smaller piece of rock, would have caused a useful expenditure of power in breaking the rock to fragments, leaving a smaller residue for useless vibrations.

Stamps may be classed under two heads. First, those with a free fall. Second, those whose fall is accelerated by a force added to that of gravity. The latter division includes all those of which the fall is accelerated by the pressure of steam, air, or springs.

The same amount of mechanical power may be expended in raising a heavy stamp a certain height, or in raising a lighter stamp to a proportionally greater height, or in raising a light stamp to the height of the heavy stamp, and then accelerating its fall by a pressure equal to the difference of weight. In all these cases the amount of power expended is the same, while the useful effect will be different.

It must be distinctly realized that all solid bodies, however hard, are to some extent elastic, and therefore capable of compression, within certain limits, without fracture. A body is harder as the resistance it offers to change of shape is greater; more brittle as the limits are narrower, within which change of shape may be effected without fracture. A stamp falling on a block of rubber may cause a depression of 3 inches; falling on a block of granite, a depression of $\frac{1}{30}$ of an inch. The pressure to which the blow is equivalent is inversely proportional to the depth of compression. The pressure on the granite will be 150 times that on the rubber. The time occupied in effecting this depression will, according to the laws of retarded motion, be twice that occupied by the stamp in passing freely, at its maximum velocity, over an equal space. In striking the rubber block, the stamp will be brought to rest in a time during which, at its maximum of velocity, it would have fallen six inches. Striking the granite block, effecting a depression of $\frac{1}{30}$ of an inch, it is brought to rest in a space of time during which it would have fallen $\frac{1}{25}$ of an inch had the block not been there.

A stamp which has fallen freely 15 inches, will have attained a velocity of 9 feet per second, (very nearly,) and will be arrested by the rubber in $\frac{1}{18}$ of a second, by the granite in $\frac{1}{2700}$ of a second. The speed with which the vibration, or impulse of compression, is transmitted through a solid body, is far greater than the greatest velocity of any stamp. At the instant the stamp has come completely to rest, the compression it has made will have extended into the block to a depth ranging with the nature of the material.

Vibrations are transmitted through granite with a velocity of 1,660 feet per second. In the case presupposed, the stamp will have ex-

* The discussion occupying the remainder of this chapter was contributed at my request by Mr. William Main, jr., of Columbia, South Carolina. It will be found to contain a clear and interesting statement of the principles involved. Whether its application is valid for all velocities, even the very high ones of direct-acting steam-stamps, depends, as Mr. Main hints, upon the success with which the other conditions of feed, discharge, water-supply, and amalgamation are adapted to the increased speed.

pended its whole force in $\frac{1}{2700}$ part of a second, and the compression caused by it will have extended a little over 7 inches in all directions from the stamp. The figure of this solid of compression, (if it may be so termed,) which has taken up the whole force of the stamp, will approach a hemisphere having a radius of 7 inches.

Let us suppose that instead of raising a stamp of 400 pounds weight to a height of 15 inches, an equal amount of power is expended in raising a 100-pound stamp to four times the height, or in raising it 15 inches, and then accelerating its fall with a pressure of 300 pounds of steam: in each case 500 foot-pounds are consumed, the final velocity of the lighter stamp being twice that of the heavier.

To compare the effects of bodies possessing the same mechanical movement but different velocities, let V denote the velocity with which the resistance R is encountered at the beginning of the time T . Let v denote the final velocity, G the weight of the body, and g the acceleration due to gravity. We have then from the laws of retarded motion the formula—

$$v = V - \frac{R}{G}gt$$

When the body is brought to rest, v becomes zero and the equation

$$V = \frac{R}{G}gt$$

t being the time required in coming to rest.

If a body of one-fourth the weight, ($\frac{1}{4}G$), having a double velocity, ($2V$), encounter an equal resistance, it will be brought to rest in a space of time represented by t' . By substituting these values and combining the new equation with the last, we find $t' = \frac{1}{2}t$. The body of one-fourth weight, but double velocity, comes to rest in one-half the time, expending, of course, an equal mechanical power.

Applying these principles to the case in point, we see that, as the lighter stamp expands its whole force in $\frac{1}{5400}$ part of a second, the compression caused by it can extend in that time but $3\frac{1}{2}$ inches into the block. If the face of the stamp-shoe is very small, the bulk of rock over which the compression would extend itself, would be to that compressed by the heavier stamp very nearly as one to four, or inversely as the cubes of the velocities. If the upper face of the block is not larger than that of the stamp, the whole compression will be transmitted directly downward, and the bulk of rock compressed will be inversely as the velocities.

By the more rapid blow the same amount of mechanical power has been concentrated on a smaller bulk of rock and the crushing effect is proportionally greater. Let us suppose the block of stone to be formed into a die with a face equal to that of the stamp-shoe and a depth of $3\frac{1}{2}$ inches. At the instant when the heavy free-falling stamp has come to rest, exerting its maximum of compression, one *half* of the force of the blow will have passed through the block into the foundation and be expended, in jarring it and the ground about it. If, as before said, the stone be just strong enough to resist the blow, the whole force of compression will pass off in useless vibrations.

If the lighter stamp with accelerated motion strike the same block, the compression produced by the blow will not have extended to the foundation, before the whole force of the stamp is expended. The stone will therefore be crushed to pieces.

Future economy in stamping is likely to be attained, not by increasing the weight of stamps, but the velocity of the blow. Practical objections to a high lift are numerous. Velocity can be much better attained by accelerating the fall, as the height of the lift may remain the same or even be diminished, and a greater number of blows struck per minute. The forging of hot iron so obviously demanded this, that the principle has long since been applied to the trip-hammer.

In wet stamping, the rapidity with which a stamp is raised, influences greatly the amount of solid matter held in suspension. As the stamp rises, water flows from all sides to supply its place. The more rapid the rise of the stamp, the greater will be the velocity of the water, and the more surely will the finely crushed rock be whirled up into a state of suspension. If the blow is succeeded by another before the finer particles have settled, the stamp will act only on the coarser particles, packing less and sending more of the slime through the screen.

In some of the later forms of the stamp-mill, while the principle of an accelerated blow is adopted, other novelties with which it has been combined have been less well conceived, and have done much to conceal its advantages.

The principle of high velocities finds its commonest illustration in the action of a bullet on a freely suspended object. If it be a block of wood, even although too thick for the ball to pass entirely through, almost the whole of the mechanical effect will be expended in crushing and dividing the fibers directly in its path, leaving little residue for producing oscillations. A heavier body with less velocity, would cause less crushing but greater oscillations. Stamps of high and low velocities of stroke have similar comparative effects in crushing the fragments of rock lying immediately under them, or jarring the mortar-bed.

In blasting rock, quickness of explosion is equivalent to velocity of impact. The force of compression radiates in all directions from the drill-hole. While the slower explosives take advantage of the weaker seams and have a splitting effect that runs to greater distances, the crushing and shattering effects of the explosion will vary directly as the volumes of gas generated, and inversely as the cubes of the times of explosion.

CHAPTER XII.

CONTRIBUTIONS TO THE RECORDS OF LEAD-SMELTING IN BLAST-FURNACES.

A marked peculiarity of most of the smelting-works of the far West is the looseness with which accounts of the operations are kept.* Indeed, probably over half of the works do not keep any detailed accounts at all, the yearly gross statement of profit or loss being considered sufficient for all purposes. The reasons for this must apparently be sought in the as yet unsettled state of *all* business relations, and in the deplorable fact, that only in isolated cases educated metallurgists are in charge of the smelting-works. Continual and regular assays of the ores, by-products, and slags are almost unknown, so that it is impracticable to ascertain, even approximately, the losses in the smelting processes.

Of cases, where regular accounts are kept of the quantities of ore smelted, of the composition of charges, and of the fuel consumed, I know only two or three. Under these circumstances it is extremely difficult to collect figures which cover the operations for a considerable length of time, and which are so valuable for the metallurgist, who wishes to get an insight into the economy of smelting operations, as shown by practice. Figures obtained by personal observation, which can of course cover only the brief space of the visit of the traveling metallurgist, must, therefore, be made to replace the more valuable data.

The writer has had occasion during the last and the preceding summer to visit the larger number of the western lead-smelting works, and offers, in the following pages, such data relating to the economy of lead-smelting in the blast-furnace at various works, as he has been able to obtain. The only object in doing so is to place these figures on record, so that they may be from time to time supplemented with other data, which are now wanting.

THE EUREKA CONSOLIDATED COMPANY'S SMELTING-WORKS.

These works smelt the ores from the mines of the same company on Ruby Hill, Eureka, Nevada. The supply is almost unlimited, but the ores are comparatively poor. They are ferruginous carbonates, with occasional lumps and masses of galena, containing, in the summer of 1872, on an average about 12 per cent. of lead, and \$25 to \$30 per ton in gold and silver, the values of the two precious metals being about equal. Arseniate of iron enters largely into the composition of the ore, so that a "speiss," principally an arsenide of iron, is formed in smelting the raw ores. Since last noticed, several important changes have taken place in these works.

There are at present five large blast-furnaces for the ore-smelting, of which Nos. 1, 2, 3, and 4 were in blast during my visit in the summer of 1872; No. 5 being in the course of construction.

No. 1 is a rectangular furnace. The dimensions of the hearth, at the

*This chapter was prepared by my deputy, Mr. A. Eilers, and presented as a professional paper at the Boston meeting of the American Institute of Mining Engineers, in February, 1873. It will be found practically valuable by the owners and managers of American works.—R. W. R.

level of the slag-spout, are $6\frac{1}{2}$ by 3 feet; at the tuyeres, which are 12 inches above the slag-spout, 5 by 3 feet. One foot above the tuyeres a short bosh commences, sloping back at an angle of 45 degrees, until the section of the furnace is 5 feet 9 inches by 4 feet 6 inches. From here to the top the walls are perpendicular. The total height from the tuyeres to the charge-door is 10 feet.

There are eight water-tuyeres of $3\frac{1}{2}$ inches nozzle, two of which lie horizontally in the back and parallel to each other; and three in each side, also parallel to each other. But the opposite tuyeres, instead of blowing directly toward each other, are all pointed forward, so that lines through the axes of the front pair, for instance, meet about 6 inches back of the middle of the breast. The blast is supplied by a No. 8 Sturtevant blower, which makes 2,100 revolutions per minute. Pressure of wind=1 inch mercury.

Nos. 3 and 4 are octagonal furnaces, with the same area of hearth as No. 1; but they have only seven tuyeres each. Otherwise they have the same bosh, height, and vertical walls. They smelt the same charge as No. 1, and do equally good service.

Charge for Nos. 1, 3, and 4.

Charcoal:	6 measures at 1.2 bushels=7.2 bushels at 15 lbs.=108 lbs.	
Ore:	40 shovels at 15 lbs. = 600 lbs.	(100)
Slag:	2 shovels at 15 lbs. = 30 lbs.	630 lbs. (5)

Smelted in 24 hours:

Ore: 50 tons.

Slag: 2.5—5 tons. 52.5—55 tons.

Coal consumed.....1,200 (1,197) bushels=9 tons.

Coal consumed per ton of charge...22.8 bushels=342 lb.=17.1 per cent.

Coal consumed per ton of ore.....24 bushels=330 lb.=18 per cent.

Cost of labor in twenty-four hours per furnace, smelting 50 tons.

3 smelters, at \$4.50	\$13 50
6 helpers, at 4.00	24 00
6 chargers, at 4.00	24 00
	\$61 50

To this must be added:

* $\frac{1}{4}$ of wages of engineers.....	\$4 50
$\frac{1}{4}$ of wages of two foremen.....	3 00
$\frac{1}{4}$ of wages of blacksmith.....	1 50
$\frac{1}{4}$ of salary of metallurgist.....	3 33
For roustabouts, &c.....	12 00
	24 33

Total	85 83

Cost of labor per ton of ore, \$1 .71.

The cost of repairing furnaces, wear and tear of machinery and tools, oil, and materials generally, as well as the waste of coal in handling, must be added to the costs given above. They are not in my possession at present, but to judge from the total cost of smelting given in the

*Assuming that four furnaces are running at a time.

annual report of the Eureka Consolidated Company for 1871, these items must foot up heavily.

Furnace No. 2 is smaller than the others, and is charged differently. The size of the hearth at the level of the slag-spout is 5 by 3 feet; at the level of the tuyeres, $3\frac{1}{2}$ by 3 feet. Above the bosh, which effects the transition to the larger section in the same manner as described in the larger furnaces, the size is 4 feet 6 inches by 4 feet 3 inches, and the whole height above the tuyeres is 10 feet. There are 4 tuyeres of $3\frac{1}{2}$ inches nozzle. Pressure of wind, 1 inch mercury.

Charge for No. 2.

Charcoal: 2 measures at 1.2 bushels=2.4 bushels at 15 lbs.=36 lbs.			
Ore: 11 shovels at 15 lbs.	=165 lbs.		(100)
Slag: 1 shovel at 15 lbs.	= 15 lbs.	180 lbs.	(9.09)
Smelted in 24 hours: Ore, 30 tons.			
	Slag, 1.5 to 3 tons—31.5 to 33 tons.		
Coal consumed,	870 bushels=6.525 tons.		
Coal consumed, per ton of charge,	26.6 bushels=399 lbs.=19.95 per cent.		
Coal consumed, per ton of ore	29.09 bushels=436 lbs.=21.81 per cent.		

Cost of labor in twenty-four hours per furnace, smelting thirty tons of ore.

3 smelters, at \$4.50.....	\$13 50
3 helpers, at 4.00.....	12 00
3 chargers, at 4.00.....	12 00
	\$37 50

To which must be added:

$\frac{1}{4}$ of wages of engineers.....	4 50
$\frac{1}{4}$ of wages of two foremen	3 00
$\frac{1}{4}$ of wages of blacksmith.....	1 50
$\frac{1}{4}$ of salary of metallurgist	3 33
For roustabouts, &c.....	8 00
	20 33

Total	57 83
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Cost of labor per ton of ore, \$1.93.

The remarks as to the other costs, made in speaking of the larger furnaces, are equally applicable here.

THE RICHMOND CONSOLIDATED COMPANY'S WORKS.

This company smelts the same class of ores as the foregoing, but they are richer in lead and silver. They come from the Richmond and Tip-Top mines, on the western end of Ruby Hill, Eureka, Nevada. The furnace running in the month of August, 1872, was an exact copy of furnace No. 1 of the Eureka Consolidated Company, with the single exception of the depth of the furnace above the boshes, which was 6 feet 6 inches.

Charge.

Charcoal: 18 scoops=5.5 bushels at 15 lb.=82.5 lbs.	
Ore: 25 shovels at 18 lbs.=450 lbs.	(100)

Slag: 2 shovels at 15 lbs. = 30 lbs. 480 lbs. (6.66)
 Smelted in 24 hours 180 (?) charges = 40.5 tons of ore, or
 43.2 tons of charge.
 Coal consumed, 990 bushels = 7.425 tons.
 Coal consumed, per ton of charge, 22.9 bushels = 243.5 lbs. = 17.17 per cent.
 Coal consumed, per ton of ore, 24.4 bushels = 366 lbs. = 18.3 per cent.

The cost of labor at these works is not in my possession. I can only say that the same number of workmen are employed immediately around the furnace, as at No. 1 furnace of the Eureka Consolidated Company, but the cost of supervision, blast and roustabouts is different, and as only one furnace is run, probably considerably higher per ton of ore than at the works mentioned. At the Richmond works the top of the furnace is intentionally kept blazing, eight billets of wood being thrown in on top after every charge. The effect claimed is the melting of the dust, and its adhesion in that state to the walls of the stack, from which the crusts are from time to time loosened and allowed to fall into the furnace. It is evident that only a very small portion of the dust can be arrested in this way, and more than probable that there is more dust created, when this device is employed, than there would be without it, to say nothing of the lead and silver which must be volatilized.

THE MILLER MINING AND SMELTING COMPANY'S SULTANA WORKS.

The works are located near the head of American Fork Cañon, Utah. The ores smelted come from the Miller mine, near by, and consist of very ferruginous oxidized ores of lead, containing much galena and very little quartz, too little, in fact, to permit the formation of a fluid slag in smelting the ore alone. This fact, however, was not understood by those running the works in the summer of 1872. The ore contained, according to many assays, 40 to 42 ounces of silver and 0.4 to 0.6 ounce of gold per ton, and 56 per cent. of lead.

There are three circular furnaces of the Piltz pattern, 9 feet high above the tuyeres. The section of the hearth of No. 1 is 28 by 36 inches. It has six water-tuyeres with 2½-inch nozzles. The size of Nos. 2 and 3 in the hearth is 24 by 32 inches. They have four tuyeres each, of the same size as No. 1. They lie about 6 inches above the slag-spout, and are inclined inward, so that they must blow directly on the metal-bath, thus occasioning volatilization of lead.

All the furnaces are provided with the automatic tap.

Charge.

Charcoal: 6 scoops = 1.8 bushels @ 16 lbs. = 28.8 lbs.
 Ore: 5 shovels at 20 lbs. = 100 lbs.
 Slag: About ¾ shovel at 16 lbs. = 12 lbs.
 ————— 112 lbs.

Smelted in 24 hours: 240 charges = 12 tons of ore or
 13.44 tons of charge.

Coal consumed: 432 bushels = 3.45 tons.

Coal consumed per ton of charge: 32.1 bushels = 513.6 lbs. = 25.68 per ct.

Coal consumed per ton of ore: 36 " = 576 lbs. = 28.8 per ct.

The product per furnace at these works in 24 hours was 4 to 4.5 tons of lead, containing 85 to 121 (rarely) ounces of silver and 1.2 to 1.45 ounces of gold. This shows an enormous loss of lead and of the

precious metals. There are two causes for this, both evident at once to the observer. The first is the flaming top of the furnaces, out of which a roaring bundle of fire issues continually, tearing along great quantities of fine ore and coal, which are deposited in a thick layer on the roof of the smelting-building and in the vicinity. The second is the fact that the slag produced is far too basic, thus enveloping metallic lead and matte and preventing separation. There is no matte saved, so far as I know.

THE SATURN WORKS.

These works are situated at Sandy Station, eleven miles south of Salt Lake City. The ores smelted are principally ferruginous carbonates with some galena from the Cottonwood Cañons, quartzose carbonates from Bingham Cañon, and occasionally ores from Tintic. (?) There are three small circular furnaces of the Piltz pattern, with four tuyeres, two in the back and one in each side. One Sturtevant blower, driven by steam, supplies the blast, which is kept at a pressure of about 1 inch quicksilver. Two furnaces were running at the time of my visit (August 23, 1872.) Slag free and apparently a singulo-silicate.

Charge.

Charcoal: 4 scoops = 1.2 bushels at 16 lbs. = 19.2 lbs.	
Ore: 3 large shovels at 20 lbs. = 60 lbs.	(100)
Rawlins iron-ore: 1 shovel 15 lbs.	(25)
Limestone: $\frac{1}{2}$ shovel 6 lbs.	(10)
Slag: 1 shovel 15 lbs.	(25)
	—
	96 lbs.

Smelted in 24 hours: 345 charges = 10.35 tons of ore, or
16.56 tons of charge.

Coal consumed: 414 bushels = 3.32 tons.

Coal consumed per ton of charge: 25 bushels = 400 lbs. = 20 per ct.

Coal consumed per ton of ore: 40 bushels = 640 lbs. = 32 per ct.

BRISTOL & DAGGET'S WORKS.

This establishment is situated in Bingham Cañon, Utah.* The ores smelted are very siliceous carbonates containing little iron, and some galena, principally from the Winnemuck mine, on the hillside behind the works. There are two circular Piltz furnaces, 14 feet high above the tuyeres. Their diameter at the level of the tuyeres is 3.5 feet. There are six of the latter with 2 $\frac{1}{2}$ -inch nozzles, lying 10 inches above the slag-spout. The blast is supplied by two large Root blowers, and a pressure of 1.5 inches mercury is maintained.

A report for three months from April 1 to June 30, 1872, furnishes the following items:

Average assay of ore smelted: Lead, 37.7 per cent.

Silver, 56.18 ounces per ton.

Smelted: Ore	1,268.000 tons.
Iron oxide	407.888 "
Limestone	518.140 "
Own slags	208.352 "

Coal consumed: 74.830 bushels = 598.64 tons.

* A review of the operations of these works for 1872 from the pen of Mr. Dagget, will be found in the next chapter.—R. W. R.

This gives an average charge as follows:

Ore	100	
Iron oxide.....	32.16	
Limestone	40.86	
Own slags	16.43	
		189.45
Charcoal.....		47.2
Coal consumed per ton of charge:	31.14 bush.=498.24 lbs.=24.9 per ct.	
Coal consumed per ton of ore:	59.00 bush.=944. lbs.=47.2 per ct.	

The product from the above materials was:

Lead	439.951 tons.
Silver.....	67,478.2 ounces, which would show an apparent loss of
Lead.....	7.9 per cent.
Silver.....	5.3 per cent.

This loss, it will be observed, is not a very large one for western circumstances. That Bristol and Daggett's works lose less in lead and silver than any other smelting works in the west, with the single exception of, perhaps, one or two at Eureka, Nevada, seems, at any rate, certain. The average length of campaigns at these works is from twenty to twenty-two days, and 14 tons of ore are smelted in twenty-four hours. Iron ore from Rawlins costs \$25 per ton; limestone, \$7; coal, 33 cents per bushel, and ore, (mining, including all prospecting and construction,) \$6 per ton. The cost of labor is not in my possession.

BELSHAW AND JUDSON'S SMELTING-WORKS.

These works are located at Cerro Gordo, Inyo County, California, and smelt the ore from the Union mine, consisting of gray carbonate, ferruginous earthy carbonates and galena. Small quantities of very siliceous true silver ores are added to the charge for the purpose of concentrating their silver in the lead. The furnace is a low round shaft-furnace with three cast-iron tuyeres of $2\frac{1}{2}$ inches diameter, lying about 12 inches above the slag-spout. The diameter of the furnace is uniformly 30 inches from the tuyeres to the charge-hole, the latter being $7\frac{1}{2}$ feet above the former. The lower part of the furnace up to within 5 feet above the tuyeres is constructed of masonry. On the top of this rests an iron cylinder $2\frac{1}{2}$ feet high, its upper rim reaching to the bottom of the charge-hole. Above are again 3 feet of masonry, from which the flue leads into a so-called "down-throw" and a low chimney. The furnace is not charged up to the charge-door, but only to the lower edge of the iron cylinder, it being claimed that if the furnace is filled to the top, the smelting is much slower, and considerably more coal is used per ton of ore. This can only be explained by great weakness of the blast, the increased weight of a higher column of charge preventing the penetration of the blast to the middle of the furnace. With a proper blast the heightening of the smelting column should cause a saving of fuel and an increased production. The blast is supplied by a small Root blower, (No. 2,) which is driven by a 10 horse-power engine. The blower makes 325 revolutions per minute, which is many times more than it is intended to make by the builders. The consequence is that frequent repairs become necessary. Formerly the ores were first roasted and slagged in a Mexican "galemador," and then smelted in the shaft-furnace, but the slag falling at that time contained still from 15 to 20 per cent. of lead with 1 to 4 ounces of silver per ton. It was found that in smelting the

ores immediately in the blast-furnace, the slags contained only from 8 to 10 per cent. of lead, and less silver than formerly. So the latter less expensive process was altogether introduced, as the choice of the least evil of the two. It is the pride of these works that they smelt comparatively more ore with less fuel in twenty-four hours than any other works in the country. But from the great loss of lead it is evident why this is the case, to wit, because so large a portion of the lead in the ore is not reduced at all, and, consequently, consumes no carbon for that purpose, but is converted into a silicate of lead which requires little heat for fusion. The charcoal is a very excellent article, and made altogether of pinon and mahogany.

Charcoal:	175 bushels at 18 lbs. =	31.5 lbs.	
Ore, fine carbonate:	12 shovels at 16 lbs. =	19.2 lbs.	(100)
Ore, Galena:	1 “ =	20 lbs.	(10.4)
Ore, quartzose silver ore:	1 “ =	15 lbs.	
		—	227 lbs. (7.8)
Slag: 2 shovels at 15 lb			30 “ (15.6)
			—
			257 lbs.

Smelted in 24 hours, 200 charges = 22.7 tons of ore, or 25.7 tons of ch'ge.

Coal consumed: 350 bushels = 3.15 tons.

Coal consumed: per ton of charge, 13.6 bushels = 244.8 lbs. = 12.2 per ct.

Coal consumed: per ton of ore, 15.4 bushels = 277.1 lbs. = 13.8 per ct.

The consumption of fuel is remarkably small, and it is only possible for the reasons above stated. It is to be regretted that exact data could not be obtained at the works, to elucidate the economical bearing of the Cerro Gordo process fully and incontrovertibly. As it is, there is barely a sufficiency of data on hand to show that fuel is economized by means of an almost unprecedented loss of lead. It is also claimed by the manager of the works that it is cheaper to lose the lead than to procure iron oxides for the purpose of mixing with the charge. But whoever has seen the enormous masses of hydrated oxide of iron in the Cerro Gordo mines, will hardly be able to realize this.

The whole management of the works is rather calculated to create the suspicion that the proper composition of the charge is not understood. It is certain that either by an addition of iron oxide to the present charge, or by omitting the addition of the quartzose silver ores altogether, far better results might be obtained than at present. The exact proportion of the smelting mixture ought, of course, to be regulated upon determination by analysis.

The following are a few additional data, which help to give some idea about the work done at this smelter. Two hundred charges are generally made in twenty-four hours; when the furnace is in the best smelting order, the number of charges in twenty-four hours rises sometimes as high as 240. From 100 to 148 bars of bullion are made in twenty-four hours, a bar weighing 85 pounds. Different lots of bullion contained respectively 130, 125, 147, 145, 134 ounces of silver per ton. The lead bars, after deducting the silver, contain 98 per cent. of lead, the principal impurity being copper, which comes originally from the quartzose silver ores. It enters into the lead, because the lead-copper-matte, which forms in the proportion of 100 pounds to one ton of bullion, is always given back raw into the smelting process. The fine ore contains about 25 ounces of silver per ton, the galena from 50 to 80, the silver ore, third class, 50 ounces, second class, 65 to 100 ounces, first class, 250 to 300 ounces, the abundance of these three classes being in

the order given. The silver ores proper are bought from other parties, \$20 per ton being paid for third class. The Union mine, furnishing the lead ore, belongs to the works. The average contents of lead in the charge is not precisely ascertained at the works, but from calculation it must be about 34 per cent., if 22.7 tons of ore furnish 5.25 tons of bullion, and the slag contains 15 per cent. of lead.

All that has been said of the last works applies also to Beaudry's furnace in the same district.

THE OWEN'S LAKE SILVER MINING AND SMELTING COMPANY.

The works of this company are located at Swansea, ten miles west of Cerro Gordo, on the eastern shore of Owen's Lake. This company has two furnaces, which are in their general features like those just described. They are 8 feet high above the tuyeres, of which there are three, with 3-inch nozzles in each. They lie only a few inches above the slag-spout, and are inclined downward. This accounts for the formation of the extremely small quantity of matte produced, though there is more sulphur in the charge smelted here than in that of Belshaw's works. Hereafter these works will smelt the lead ores of Santa Maria and Cerro Gordo, together with such small quantities of quartzose silver ores as can be bought to advantage, and the charges for the furnaces can, therefore, be kept more uniform than formerly, when small lots of different custom ores were smelted, as they could be picked up. Daily records have heretofore not been kept at the works, but the following is given as about an average charge : *

Charcoal : 60 to 80, average 70 bushels at 18 lbs.	= 1,260 lbs.	
Ore : 3 tons of carbonates	= 6,000 lbs.	(100)
1 ton galena	= 2,000 lbs.	(33.3)
0.5 ton of quartzose silver ore	= 1,000 lbs.	(16.6)
	9,000 lbs.	
Slag : 0.675 ton	1,350 lbs.	(22.5)
Total	10,350 lbs.	
Coal consumed per ton of charge, 13.52 bushels	= 243.36 lbs.	= 12.16 p. c.
Coal consumed per ton of ore, 15.55 bushels	= 280 lbs.	= 14.11 p. c.

Fuller returns from these works are promised hereafter.

For the purpose of comparison, I give here the blast-furnace charges and a short description of the furnaces of European works, which beneficiate lead ores by the same or similar processes, as practiced at the American works above enumerated.

WORKS AT LA PISE, DEPARTEMENT DU GARD, FRANCE.

These works employ a circular furnace of about 30 inches diameter at the tuyeres and above. The tuyeres, of which there are three of not quite 2-inch diameter, lie in pillars of masonry between water-cooled cast-iron plates, 0.82 feet above the slag-spout. Only two of the tuyeres are generally used in smelting. The total height of the furnace above the tuyeres is 9 feet 6 inches. Campaigns last from two to three months. Pressure of blast 1.18 inches mercury.

The ores treated come from Pallières, near Anduze, and from Sardinia.

* These items were obtained in September, 1872. Since then the charges have been changed.

The former are reported to contain, after roasting, 40 per cent. of lead, 0.11 per cent. silver, and 20 per cent. silica. In twenty-four hours 8.8 to 11 tons of ore are smelted with 25 per cent. of coke = 2.2 to 2.75 tons.

Charge.

Roasted ore	10 tons.
Limestone.....	2.5 tons.
Iron ore.....	0.3 to 0.4 tons.
Iron	0.2 to 0.3 tons.
	13.2 tons.

Metallurgists generally rate the effect which can be produced with one ton of coke equal to that of 200 bushels of inferior charcoal, weighing 12 pounds per bushel, or 2,000 pounds of coke = 2,400 pounds charcoal. According to the above, 25 per cent. of coke is used in smelting the ore in the La Pise shaft furnace. The charge, in which there are ten tons of ore, requires, therefore, 2.5 tons of coke. Expressing this in charcoal, weighing 15 pounds to the bushel—which is the fair average weight of western charcoal—we have 400 bushels of charcoal consumed to smelt ten tons of ore. Therefore:

Coal consumed per ton of charge, 30.3 bush. at 15 lbs. = 454.5 lbs. = 22.7 p.c.
 Coal consumed per ton of ore... 40 bush. at 15 lbs. = 600 lbs. = 30 p.c.

SMELTING WORKS AT CLAUSTHAL, LAUTENTHAL, AND ALTENAU.

The smelting is done in Raschette furnaces, 3 meters (9.8 feet) long, and 0.94 meters (3.08 feet) wide at the tuyeres, and 6.277 meters (20.59) feet high, with ten tuyeres of 0.049 meters (0.16 feet = 1.92 inches) diameter. In twenty-four hours, 7,500 kilograms = 16,500 pounds of ore, or 20,000 kilograms = 44,000 pounds of charge, are smelted with 2,500 kilograms = 5,500 pounds of coke, the latter, according to the data above given, equal in effect to 440 bushels of charcoal.*

From the above it appears that, expressing the values for fuel as charcoal, there are consumed—

Per ton of charge.... 20 bush. at 15 lbs. = 300 lbs. = 15 per cent.
 Per ton of ore..... 53.33 bush. at 15 lbs. = 799.95 lbs. = 39.99 per cent.

The charges at the three works named are as follows:

	Clausthal.	Lautenthal.	Altenau.
Ore	100	100	100
Roasted matte	51	56	50
Copper slags from the Lower Hartz.....	60	115	87.3
Slags from the same smelting.....	93	75	55.3
Dressed furnace scrapings	3	.....	.....
Slag from the smelting of scrapings in the copper process.....	.....	.....	26.6
Scraps rich in lead .....	.....	.....	4
	307	346	321.2

Early in 1872, when the "Kast" furnace had been introduced and in operation for some time, Mr. A. Wolters, M. E., assayer of the United

* Further and late information in regard to the furnaces and smelting operations at the Upper Hartz can be found in *Metallurgie des Bleies*, by Dr. C. Rammelsberg, pages 248-270.

States assay office, Boise City, returning from Clausthal, brought the following notes: The charges for both the "Kast" and Raschette furnaces were, with due regard for the differing gangue of the ores and the varying contents of lead and silver, mixed so in quantities of 1,000 cwt., (dry,) that the average contents were—

Lead	58 to 60	per cent.
Silver....	0.1	per cent.

and the proportion of the different gangues was made so as to furnish an easily fusible slag.

Such a quantity of 1,000 cwt. was divided into 20 "charges" of 50 cwt. each. To this "charge" are then added the following substances in the proportions given:

Ore	100
Roasted matte from former smelting	50
Copper slag from Lower Hartz	80
Slag from matte-smelting	40
Impure slag from same process	32
	302

The last two items vary somewhat, according to the acidity of the gangue. To the charge of the Raschette furnace there are often added twenty additional parts of slag from the same smelting.

The quantity smelted in a Kast furnace in twenty-four hours, according to an average of a month's working, is 63 cwt. of ore, or 190.26 cwt. of charge, equal to about 9.5 tons—100 cwt. of ore requires 51 cwt. of coke in smelting. One pound of coke carries, therefore, according to the foregoing, approximately six pounds of charge, or 16.66 per cent. of coke are used. Assuming again the effect of one ton of coke, equal to that of 160 bushels of charcoal of 15 pounds each, we have—

Charcoal consumed per ton of charge: 27.7 bushels @ 15 lb.=415.5 lb.=20.77 p. c.

Charcoal consumed per ton of ore: 81.6 bushels @ 15 lb.=1224 lb.=61.2 p. c.

SMELTING WORKS OF FRIEBERG, SAXONY.

All the ores occurring in the Freiberg mines are now subjected to the same metallurgical treatment, with the exception only of the ores containing more than 30 per cent. of zinc, and those containing a large amount of arsenic. These two classes are specially treated.

The ores smelted at the "Muldenner Hütte" during 1869 (16,589,500 kilograms = 36,573,211 lb.=18,286.60 tons) contained on an average 17.6 per cent. of lead, and 0.6 per cent. Cu. The smelting, both at the "Muldenner" and at the "Halsbrückner" works, is done in round shaft-furnaces (with 8 tuyeres each) of 1.726 M. =5.66 feet diameter, and a height of 3.84 M. =12.59 feet above the tuyeres.

<i>Muldenner Hütte.</i>	<i>Charges.</i>	<i>Halsbrückner Hütte.</i>
Roasted ore.....	100	100
Raw matte.....	10	3.03
Kiln-roasted pyrites	15	—
Slag.....	80—100, Avg. 90	50
Entzinkungsrückstände.		3.338
Fluorspar.....		0.35
Calcspar		1.583
Heavy spar.....		0.145

In twenty-four hours at the former works (25,000 to) 30,000 kilograms ore = (55,000 to) 70,000 kilograms charge are smelted; at the latter 35,000 kilograms ore = 50,000 kilograms charge. (11 to) 12 per cent. of coke (referring to the charge) are used.

This shows for

Muldener Hütte.

Charge 70,000 kilograms = 154,322 pounds English.

Coke consumed 12 per cent. = 18,518 pounds, which is equal in effect to 1,481.44 bushels of charcoal of 15 pounds each.

Charcoal consumed, per ton of charge: 19.2 bushels = 288 pounds = 14.4 per cent.

In the 70,000 kilograms charge are 30,000 kilograms ore = 66,138 pounds English.

Therefore:

Charcoal consumed per ton of ore: 44.8 bushels = 672 pounds = 33.6 per cent.

Halsbrückner Hütte.

Charge 50,000 kilograms = 110,230 pounds English.

Coke consumed, 12 per cent. = 13,227.6 pounds, equal in effect to 1,058.2 bushels charcoal, of 15 pounds each.

Charcoal consumed per ton of charge: 19.2 bushels = 288 pounds = 14.4 per cent. 50,000 kilograms charge contain 35,000 kilograms = 77,161 pounds English, ore. Therefore:

Charcoal consumed per ton of ore: 27.4 bushels = 411 pounds = 20.5 per cent.

The following table gives a comprehensive summary of the amounts per ton, and percentage of fuel used, at the American and European works, brought forward in the foregoing article.

CONSUMPTION OF CHARCOAL IN LEAD BLAST-FURNACES.

Names of smelting-works.	Bushels of charcoal per ton of—		Pounds of charcoal per ton of—		Percentage of charcoal per ton of—	
	Charge.	Ore.	Charge.	Ore.	Charge.	Ore.
<i>American works.</i>						
1. Eureka Consolidated Company:						
a. Furnaces Nos. 1, 3, and 4.....	22.8	24	342	360	17.1	18
b. Furnace No. 2.....	26.6	29	399	436	19.9	21.8
2. Richmond Consolidated Company...	22.9	24.4	343.5	366	17.17	18.3
3. Miller Mining and Smelting Company	32.1	36	513.6	576	25.68	28.8
4. Saturn Works.....	25	40	400	640	20	32
5. Bristol & Dagget's works.....	31.14	59	498	944	24.9	47.2
6. Belshaw & Judson's works.....	13.6	15.4	244.8	277	12.2	13.8
7. Owen's Lake Silver-Mining and Smelting Company.....	13.5	15.5	243	280	12.16	14
<i>European works.</i>						
9. La Pise.....	30.3	40	454.5	600	22.7	30
9. Clausthal, Lautenthal, and Altenau:						
a. Raschette furnace.....	20	53.3	300	799.9	15	39.99
b. Kast furnace.....	27.7	81.6	415	1,224	20.7	61.2
10. Freiburg:						
a. Muldener Hütte.....	19.2	44.8	288	672	14.4	33.6
b. Halsbrückner Hütte.....	19.2	27.4	288	411	14.4	20.5

According to a supplement in Rammelsberg's "Metallurgy of Lead," the Raschette furnace at Clausthal consumes for 100 pounds of ore 48 pounds of coke, and the Kast furnace 41.6 to 42.4 pounds. Accepting for the Kast the first of the two figures given, we would have, calculated for charcoal:

	Bushels of charcoal per ton of—		Pounds of charcoal per ton of—		Percentage of char- coal per ton of—	
	Charge.	Ore.	Charge.	Ore.	Charge.	Ore.
Raschette furnace.....	25	76.8	375	1,152	18.7	57.6
Kast furnace.....	22	66.5	330	997.5	16.5	49.8

It is evident that these figures cannot be reconciled with those given before. Yet both are on equally good authority, and all those in regard to the Raschette furnace are even taken from the same author. I am inclined to think that the main error is in Dr. Rammelsberg's statement, page 258 of his *Metallurgie des Bleies*: "In twenty-four hours there are smelted 7,500 kilograms ore, with 2,500 kilograms coke." This would be a consumption of coke of only 33.3 per cent., while all other authors, who have written on the Clausthal works, have always given for the Raschette furnace a consumption of 43 to 50 pounds of coke to 100 pounds of ore.

From the foregoing tables it appears that setting the two Cerro Gordo cases aside, (sufficient reason for which is given in the text,) American works use more fuel in smelting their blast-furnace *charges* than European works, although their ores are "kindlier;" but that, in referring the quantities of coal used to the ore in the charge, American works appear to be conducted more economically in this respect. Whether *true* economy is practiced, must, for the present, remain an open question, which can only be answered after American works have begun to control their whole process by means of chemical analysis. European works generally add large quantities of slag, and other indifferent materials, from previous smeltings to their charges, in order to protect the metal, and the slags finally thrown over the dump contain usually only from 0.5 to 1 per cent. of lead, and silver in hardly appreciable amounts. American lead-slugs hardly ever contain less than 5 per cent., and in some exceptional cases up to 20 per cent. of lead, while the contents in silver correspond with those of lead. There are cases in which this loss cannot, with economy, be avoided at the present time, but there are more of those in which metallurgical skill could, without increase of cost, compose charges, the result of which would be slags as clean as the European ones. There is, however, one consolation for the present unnecessary loss: while the robbing of mines leaves them generally in such a shape that a subsequent generation cannot repair the losses occasioned by the first method of working, the robbing of ores leaves residues from which, in the future, science can profitably extract the useful constituents.

CHAPTER XIII.

ECONOMICAL RESULTS OF SMELTING IN UTAH.

The following discussion of the costs and losses of metallurgical operations in Utah was prepared at my request by Mr. Ellsworth Daggett, manager of the Winnamuck mine and smelting-works, in Bingham Cañon, near Salt Lake. In the last chapter, Mr. Eilers mentions these works as among the best managed in the West; and in my chapter on Utah, I have accorded to them similar praise. At the same time, it will be noticed by the professional reader that the practice described by Mr. Daggett is not incapable of improvement. In the item of fuel particularly, a considerable saving was effected, at the close of the year, in the introduction of coke from Pennsylvania, instead of charcoal. The results hereinafter detailed are based on the use of charcoal; but they are valuable as the careful records of actual experience. I trust that similar systematic records, the keeping of which I have strenuously urged upon western metallurgists, will permit, in future, comparisons and deductions of great importance. Scarcely any folly which the managers of such enterprises can, under present circumstances, commit, is greater than to maintain secrecy concerning their operations, when the free interchange of trustworthy information would result in immediate gain to all concerned.

The ore smelted in the Winnamuck furnace, during the year 1872, consisted for the most part of oxidized ores from the Winnamuck mine, only 60 tons of outside ore (from the Spanish mine) having been smelted. The latter, like the principal Winnamuck ore, was oxidized, or so-called carbonate ore. There was mixed with those oxidized ores 300 to 400 tons, or 7 to 10 per cent. of galena, some of which was mined with the oxidized ore, while a part was mined separately from the lower portion of the mine, and afterwards mixed with the ore, with a view of preventing the formation of deposits of metallic iron in the furnaces.

The average assay in silver of all the ore handled was 51.46 ounces per ton, most of it existing as chloride of silver.

The lead contents were 34.98 per cent., all, or nearly all, in the form of carbonate of lead. The relative amount of silver is not at all constant, the best silver ore often being poorest in lead.

The predominant gangue was silica, several determinations of which have been made on representative samples, yielding, in three such samples, 26, 38, and 58 per cent. silica—the latter test being ore containing but little lead. The average contents in silica are about 35 per cent., with 6 to 7 per cent. sesquioxide of iron and small quantities of alumina and lime. Mechanically, the ore was very fine, and so thoroughly disintegrated that it presented few distinguishing characteristics, rendering sorting or separating of ore from waste difficult and often impracticable.

Experiments on a small scale have been tried with a view to separate the silica by washing, but these were unsuccessful, as the finest slime, requiring a long time to settle in still water, contained a large amount of silver, and on a careful sizing and washing of the sands and coarser parts, the silver contents were found to be less dependent on specific

gravity than is necessary for successful concentration. The lead contained admitted of a certain degree of concentration, but not the silver.

The fluxes used were iron-ore, limestone, and slag. The iron-ore used is red hematite from Rawlins, in Wyoming Territory.

Three determinations of the iron-ore yielded respectively 66.5, 67.46, and 68.5 per cent. metallic iron. They were of different samples; the last, of an average sample of a car-load, or 11 tons. The little silica (3 per cent.) found in one analysis was probably due to dirt intermixed in transit, as the only observable gangue is calcspar, which may occasionally be found. The average may be taken at 67 per cent. iron, 2 per cent. carbonate of lime, and 1 per cent. dirt. The limestone used contained about 6 per cent. silica, and traces of magnesia.

The fuel was almost entirely charcoal, only a few tons of coke having been used near the end of December. Of the 311,996 bushels of charcoal used, 85,000 to 90,000 made from nut-pine or "piñon," was of good quality, though not equal to coal from hard-wood, such as maple, hickory, &c. The remainder was from red and white pine, cedar, and quaking asp, which, however well burned, cannot make a good or even fair fuel, especially when compared with the Connellsville coke, lately introduced. It must be understood that this statement is made solely with reference to the comparative melting powers of the two kinds of fuel, and does not take into consideration the possible increased loss in lead and precious metals, due to a much higher temperature, when coke is employed. The exact value of this latter element cannot yet be determined. With regard to the melting power, our work this year proves that one ton of Connellsville coke, weighed into the furnace, is rather more effective than two tons of the charcoal of the country; the cost of the two materials at Bingham being about the same, ton for ton.

In addition to the fact that the soft charcoal lacks in heating power under the most favorable circumstances, there is connected with its use much waste, especially when, as in Bingham Cañon, it must be transported by rail and team for a long distance, and (as is often the case) paid for at some distant point.

The amount of material smelted during the year 1872 was as follows:

Material.	Tons.	Per cent. of ore.
Ore	3,954,913	100
Iron-ore	1,391,681	35.19
Limestone.....	1,542,021	38.99
Slag.....	639,339	16.16

The slag obtained contained from 35 per cent. to 48.7 per cent. silica. The average of four analyses showed 42 per cent.; but as the analyses were mostly of unusually stiff slag, their average is too high.

The only complete analysis of slag at hand is of a sample produced from a smelting mixture containing rather more limestone and less iron-ore than usual. The analysis made at the Sheffield Scientific School of Yale College, under the direction of Professor G. I. Brush, is as follows:

Silica	37.93
Sulphide of lead	3.75
Sulphide of iron.....	.44
Alumina	2.00

Protoxide of iron	30.76
Lime.....	23.62
Magnesia.....	.57
	99.07

Although the data are not yet as complete as could be desired, we may approximately calculate the average slag analysis. The ore contained by fire-assay about 35 per cent. of lead. Allowing the loss in the fire-assay to be 2 units, we have as actual lead contents 37 per cent., equivalent to—

Carbonate of lead	47.7
Silica*	35
Sesquioxide of iron*	6.9

Other bases not determined:

Alumina, lime, &c., and sulphur	10.4
	100

Hence, we have a slag-constituting element in ore and fluxes, (except the slag charged, which, being neutral, may be omitted)—

	Silica.	Protoxide of iron.	Lime.	Other substance.
In 100 parts of ore	35	6.2	.....	10.4
In 35 parts of iron-ore .....	.....	30.2	.....	.....
In 39 parts of limestone	2.3	.....	20.5	.....
	37.3	36.4	20.5	10.4

Parts in 100:

Silica	35.6
Protoxide of iron	34.8
Lime	19.6

Other bases:

Alumina, oxide of lead and magnesia, with sulphides of lead and zinc	10.0
	100.0

As will appear below, one of the difficulties encountered in smelting has been the rapid burning out of the fire-material, and the question has been frequently asked, Why not use less flux to produce a more highly silicated slag and save the fire-material of the furnace? The answer to this is, that, with the poor fuel in use, a reduction of the quantity of the basic fluxes used caused the smelting to proceed too slowly, so that the increased cost of labor and general expenses per ton of ore more than counterbalanced the saving in flux and fire-material. Indeed, our experience indicates that, with the soft charcoal as fuel, when producing slag containing over 36 per cent. in silica, the consumption of the

* Determined by analysis of general samples.

fire-material is not materially decreased by increasing the silica-contents of the slag. This may be explained as follows: The capacity of a slag to dissolve fire-material (chiefly silica) depends directly on the temperature and inversely on the amount of silica already contained in the slag. Now, in general, any increase in the silica-contents of a slag of this description necessitates an increase of temperature, and so far as can be determined in the crude operations of a blast-furnace, the new conditions counterbalance one another.

By slags much more basic than the above the fire material is more rapidly destroyed.

The furnaces of the Winnamuck Company are two in number, and in dimensions (except height) follow the plan of the first Piltz furnace erected at the Eureka Consolidated Works, in Nevada, by C. von Liebenau, in the year 1870. There are, however, some essential points of difference in the construction.

The lower part of the furnace is built of stone, which, when properly seasoned, is as lasting as fire-brick. About four feet above the tuyeres commences the shaft of common brick, cased in sheet-iron and lined for three feet up with fire-brick, and supported by means of a flange upon four hollow iron pillars, rendering it independent of the lower part. Under the hearth is a layer of clay 6 inches in thickness, tamped upon the foundation. This latter, with the six iron plates surrounding the outside of the hearth, should render it impossible for lead to escape into the foundation.

The bottom is made of a mixture of ground clay, raw, and sand, or ground fire-brick, just sufficiently damp to pack well, and is renewed or repaired at the end of every run.

The "siphon tap," used in the Winnamuck furnace, is constructed as follows: There is left in the center of each side plate, at the height of the hearth-bottom, a round hole, 12 inches in diameter. On whichever side it is desired to have the tap, a piece of $\frac{1}{8}$ -inch sheet-iron the height of the plates (3 feet) and about 5 feet in length is bent and firmly fastened to the plates at the corners. The space thus inclosed and the channel connecting it, through the hole in the side plates, with the inside of the furnace, are now tamped full of a mixture of sand and clay, during which process a round piece of wood $2\frac{1}{2}$ or 3 inches in diameter and $3\frac{1}{2}$ feet long, having through its center a $\frac{3}{4}$ -inch auger-hole, is inclosed in the channel. The lead-well itself is cut out to the size and shape of a Hessian crucible, rather less than a foot in diameter and about $1\frac{1}{2}$ feet deep.

To provide for any impediment in the passage at any time during a run, a small hole is made in the sheet-iron casing, in the line of the horizontal passage from the lead-well into the hearth, through which a bar may be driven to the inside of the furnace, and which afterwards may be stopped with a plug of clay, thus forcing the lead up into the well. This siphon tap is a great improvement on the old method, and Messrs. Arents and Keyes, of Eureka, deserve and have the thanks of all smelters for its introduction.

Dimensions of furnace.

	Feet.	Inches.
Height of plate from foundation.....	3	
Height of columns from foundation.....	8	
Height of feed-hole from foundation.....	17	9
Height of tuyeres from foundation.....	3	8
Diameter of furnace at tuyeres.....	3	6
Diameter of furnace at feed-hole.....	5	3

	Feet.	Inches.
Diameter of furnace at top of chimney.....	3	6
Height of tuyere nozzles above slag flow.....	10 to 11	
Height of tuyere above top of plates.....	7 to 8	
Height of water-tymp-iron above slag flow.....	7 to 8	
Diameter of columns at base.....		8
Diameter of columns at top.....		6
Thickness.....		$\frac{1}{2}$
Diameter of nozzle.....		$2\frac{1}{2}$
Height of tuyere above bottom.....		27
Number of tuyeres, 6 or 7.		

That portion of the furnace above the flange to the feeding-floor is cased in $\frac{1}{8}$ -inch sheet-iron, and above this, for a height of 6 feet, in thinner sheet iron.

Operation.—In starting the furnace (which has been thoroughly dried by a slow fire and strongly heated for several hours with coal) the outer lead-well is first filled with coal, ignited on top, and a blast from one of the tuyere-pipes is forced downward through the coal, driving the flame and heat through the connection into the bottom of the furnace. This rapidly burns away the wooden plug inserted in building or repairing, and heats to redness the sides of the channel. This having been effected, the furnace is filled to the height of 5 or 6 feet with coal, and when this is thoroughly ignited, from 20 to 30 bars (2,400 to 3,600 pounds) of bullion are introduced through the charging-door. This metal, melting and descending through the ignited coal, is received on the hot bottom of the furnace, and, filling the channel, rises in the outer well, where it is carefully covered with coal-dust. A light blast is now started, and regular charges of 6 bushels of coal, and, at first, small but constantly increasing quantities of ore and flux are introduced until the furnace is full, when the blast is increased. The full charge is usually not attained for at least twenty-four hours. Slag, from the starting, is generally saved for reworking, as the greater proportion of fluxes used in the beginning of a run renders the slag more basic than usual. The average length of run during the year was sixteen days; the longest made, with fire-brick or stone, 26 days.

In charging the furnace the coal (6 bushels) is first measured in and spread upon the preceding charge; then the proper amount of ore, which has been equalized by spreading in heaps of 100 to 300 tons, is weighed; the corresponding amounts of the various fluxes are added by weight; and the whole mixture thus formed is spread over the coal.

The charge of fuel is maintained at 6 bushels, and the weight of the smelting-mixture is varied as may be rendered necessary by the alteration in slope of the furnace, or by change in the ore.

The products are silver-lead, slag, and a small quantity of iron matte, containing little sulphur, with occasionally metallic iron in small amount. As the limited quantity of matte produced contained only 14 ounces in silver per ton, nothing has been done with it.*

Cost.—The cost of smelting Winnamuck ore for the year 1872 was high, mainly on account of the large amount of flux used, and the poor quality and the high price of fuel. Below is given the cost of coal, fluxes, labor, &c. As a part of the cost of coal, is included all waste occurring after the coal was delivered at the works; but not the "shortage" or other losses on coal occurring in transit to the works.

* Some of the matte produced lately (in February and March, 1873) has contained upwards of 40 ounces (in one instance 90 ounces) silver per ton, and is, of course, saved for subsequent treatment by roasting and reworking with the ore.

Cost of handling 3,954.91 tons.

	Total.	Per ton ore.
Charcoal.....	\$96,718 76	\$24 45
Iron ore.....	\$34,792 00	8 80
Limestone.....	7,710 10	1 94
	42,502 10	
Labor.....	24,269 91	6 13
Other smelting expenses, wood, brick, &c.....	10,911 26	2 75
	174,402 03	44 09
Total smelting cost.....		
Mining cost.....	23,430 17	5 92
General expense.....	15,133 85	3 82
Sampling, assaying, and bullion charge.....	4,582 11	1 16
	217,548 16	55 00
Total cost.....		

To find what portion of the smelting-cost is due to the flux used, or, in other words, the difference between actual cost and the cost (at the Winnamuck works) of smelting an ore or a mixture of ores that would flux itself, we must deduct from the total cost the cost of the fluxes, thus:

Total cost of smelting.....	\$174,402 03
Less cost of fluxes.....	42,502 10
Cost of smelting total material, ore, iron, and limestone.....	131,899 93
Cost per ton of material (without slag).....	19 14

That is, an ore having the composition of our total material would have been handled for \$19.14 per ton, probably a little less, as no deduction is made for cost in handling the flux after it arrives at the works, which is somewhat greater than for the same amount of ore.

The other costs given above on the ore handled were: mining, which include all prospecting, dead work, &c.; general expenses, or such as belong equally to both mining and smelting, (superintendence, office expenses, salaries, &c.) and freight on the bullion, to railroads, sampling, assaying, &c.

While the above figures represent the actual outlay in money required to produce the given result, yet they do not satisfactorily show the true cost. The losses in lead and silver should be represented, since they form as truly a detail of the calculation as does the fuel in smelting, and one greater in value than the mining of the ore; moreover, as the metal lost is value consumed in the process, there is no reason why this value should not be classed as so many dollars and cents per ton of ore, as are the charcoal, the iron-ore, and the mining costs. Although it is the custom, in speaking of the cost of working ore, to name only the actual outlay, yet to one who knows that in such working there is involved a notable and variable sacrifice of the original value of the ore, and that, as in lead and silver smelting in Utah, after the smelting there is a still larger sacrifice of value in freights, separating and refining the silver and lead, the bare statement of so-called cost is far from satisfactory.

It seems necessary, especially in making comparisons of the relative values of different methods of treatment, to have some concise, definite expression which will show at a glance which of two or more methods is best; in other words, which will net to the ore-owner the most money. Such an expression can be found only by including the total value in

the ore at the outset, and accepting as cost the difference between this total value and the net return.

If we suppose the average value of the lead to have been, during the year, 7 cents currency per pound, and that of the silver, \$1.2929 coin per ounce equivalent, with gold at 113 (the average of the last nine months of 1872) to \$1.46 currency, we have—

Value of 3.82 units of loss in lead	\$5 36
3 ounces silver	4 38
Total loss per ton of ore in smelting	9 74

There is also a loss in the treatment of the bullion, a portion of which is eventually recovered by the separating and refining works. As the details of cost and losses in the treatment of bullion are known to the separators and refiners only, it will be sufficient here to regard the aggregate of costs and losses, which may be found thus:

Weight in tons of bullion produced	1, 232, 741
Weight in tons of the 191,661. 4 ounces silver contained	6, 572
Total amount of lead	1, 226, 169
1, 226, 169 tons lead at \$1.40 per ton	171, 664 66
191,661. 4 ounces silver, at \$1.46 currency	279, 825 64
Gross value of bullion at railroad	451, 490 30
Net value of bullion at railroad	353, 551 26
Difference, being freight, costs, losses, and profits of separating-works	97, 939 04
Bullion expenses, per ton bullion	79 44
Bullion expenses, per ton ore	25 00

General condensed statement of expenses per ton of ore.

Mining expenses	\$5 92
General expenses	3 82
	\$9 74
Costs of smelting to base bullion	44 09
Losses in smelting	9 74
	53 83
Bullion expenses, freight and separation	25 00
Sampling and assaying	1 16
	26 16
Total cost per ton	89 73

It may be interesting here to compare with these figures the total costs and losses involved in other methods of disposing of ores, as for instance, by selling them in Utah, or shipping them to England. In this comparison it must be remembered that by "costs and losses" is meant the difference between the money received and the gross value of the ore calculated on its assay, assuming lead at 7 cents currency per pound, and silver at 1.46 currency per ounce; also that all expenses on the ore previous to actual shipment or smelting, such as mining, transportation and (in the case of shipment) sacking, handling, sampling, and assaying, the last four items, amounting to about \$7.75 per ton, are omitted. The remaining expense, therefore, consists of the costs and losses in smelting and on the bullion produced, amounting with the Winnamuck ore, as above shown, to \$80 per ton.

Three lots Emma ore were shipped to England in 1871, amounting to 1,225 tons, and assaying:

Lead, 41½ per cent., worth per ton.....	\$57 83
Silver, 112.09 ounces, worth per ton	163 81
Gross assay value per ton at railroad, currency.....	221 64
Net value or amount received per ton, currency.....	109 55
Costs and losses per ton.....	112 09

Twenty-seven lots Emma ore were sold at open sale in Salt Lake City, August 10 to October 17, 1872, about 2,800 tons,* assaying:

Lead, 45.14 per cent., worth per ton.....	\$63 19
Silver, 69.73 ounces, worth per ton.....	101 80
Gross assay value per ton at railroad	164 99
Net value or amount received.....	71 10
Costs and losses.....	93 89

Some items affecting these figures are omitted here, such as sampling, handling, &c.—necessary in shipping, but not in smelting ore, at or near the mine. Moreover, the small amount of gold in the Winnamuck ore has not been charged to the ore. It would increase the Winnamuck costs about \$2.50 per ton of ore.

A comparison of costs and losses in milling ores containing little lead in Southern Nevada and smelting-ores in Utah, though not strictly conclusive, (the conditions being different,) indicates that the advantage usually ascribed to milling is over-estimated.

In a report on the Meadow Valley mine, of Pioche City, made during the latter part of 1871, by Aug. J. Bowie, jr., M. E., it appears (page 20) that the average production for 1870-'71 was \$105.34 per ton, being 73.4 per cent. of the total value, (silver)—

Total silver value per ton, therefore, (coin)	\$143 51
Value of production, (coin).....	105 34
Loss in silver, (coin).....	38 17
The same report, (same page,) gives the total cost—mining, milling, taxes, etc.....	44 11
Costs and loss in silver, (coin).....	82 28

Reducing this to currency at 113, we have total costs and losses in silver \$92.97. To this must be added \$1.40 for each unit of lead shown by assay to be in the ore. Assuming the average lead contents of the Meadow Valley ores to have been at that time 10 per cent., we would have total costs and losses \$106.97.

If, now, in order to institute a comparison, we take from the above sum the increase of cost due to the position of the Meadow Valley mine, involving higher costs of labor and supplies, which we may assume as not exceeding \$15 in currency, we have costs and losses in mining and milling Meadow Valley ores in Utah about \$92.

The costs and losses in mining and smelting the same ore with lead-ores in Utah should not exceed this; and, with the late improvements, such as the use of coke, &c., should be materially less. In general, the question as to the most economical treatment of an ore will be deter-

* This ore, owing to its amount and the regularity of the supply, was sold to the best advantage and commanded a price rather higher than other ore sold in open market at the same time.

mined only by a careful consideration of *all* the conditions, such as the nature of the gangue, the lead contents, and the respective losses of the different processes, with the cost of the same—the latter consideration being only one of many—and it may happen that a wasteful process is the best, or that a costly process is the cheapest, that being really the proper treatment which, however wasteful, costly, or even unscientific, enables the owner to make the most money out of his ore.*

*I am inclined to lay some weight on a distinction which Mr. Daggett here overlooks. Not only on general grounds of political economy, but also directly to the miner and smelter, *costs* are better than *losses*. The treatment which consumes in freights, for instance, a certain proportion of the value of the ore, is better than the treatment which leaves the same amount in tailings or slags too poor to be handled again. One expenditure assists trade and develops the social conditions which will cheapen all expenses; the other is a sheer waste of value. Even from a selfish standpoint, that mine-owner is not always the wisest who seeks the greatest *immediate* profit. Witness the robbery and speedy apparent exhaustion of many good American mines, by a system of robbing the rich ores.—R. W. R.

CHAPTER XIV.

THE CALORIFIC VALUE OF WESTERN LIGNITES.

The important question of the metallurgical value of the coals of the Rocky Mountains and the Pacific Coast is to be settled, of course, by practical experiment. Meanwhile, as I have had occasion to point out, the proximate analysis of these coals throws little light upon it, and is, indeed, likely to mislead the metallurgist, if he compares it with the results of similar analysis upon bituminous and semi-bituminous coals. With the view of showing how large a proportion of the material usually classed as "volatile matters" consists of combined water, or oxygen and hydrogen presumably in chemical combination, I have collected a number of ultimate analyses from various sources, in the following tables. The numbered analyses in the first table are as follows:

No. 1. Monte Diablo coal, analyst, H. S. Munro, Columbia School of Mines.

No. 2. Weber Cañon, Utah, analyst, H. S. Munro, Columbia School of Mines.

No. 3. Echo Cañon, Utah, analyst, H. S. Munro, Columbia School of Mines.

No. 4. Carbon Station, Wyoming, analyst, H. S. Munro, Columbia School of Mines.

No. 5. Carbon Station, Wyoming, analyst, H. S. Munro, Columbia School of Mines.

No. 6. Coos Bay, Oregon, analyst, H. S. Munro, Columbia School of Mines.

No. 7. Alaska, analyst, H. S. Munro, Columbia School of Mines.

No. 8. Alaska, analyst, H. S. Munro, Columbia School of Mines.

No. 9. Cañon City, Colorado, analyst, Dr. T. M. Drown, Philadelphia.

No. 10. Baker County, Oregon, analyst, Dr. T. M. Drown, Philadelphia.

No. 11. Block coal, Sand Creek, Indiana, analyst, Professor E. T. Cox.

Number.	Carbon.	Hydrogen.	Nitrogen.	Oxygen.	Sulphur.	Moisture.	Ash.	Combined water.	Calorific power I.	Calorific power II.	Calorific power III.	Temperature, deg. C.
1	59.72	5.08	1.01	15.69	3.92	8.94	5.64	17.65	5900	6472	5757	2590
2	64.84	4.34	1.29	15.52	1.60	9.41	3.00	17.46	6056	6685	5912	2536
3	69.84	3.90	1.93	10.99	0.77	9.17	3.40	12.36	6515	7172	6400	2603
4	64.99	3.76	1.74	15.20	1.07	11.56	1.68	17.10	5892	6662	5738	2512
5	69.14	4.36	1.25	9.54	1.03	8.06	6.62	10.73	6679	7264	6578	2630
6	56.24	3.38	0.42	21.82	0.81	13.28	4.05	24.55	4768	5498	4565	2313
7	55.79	3.26	0.61	19.01	0.63	16.52	4.18	21.38	4814	5766	4610	2375
8	67.67	4.66	1.58	12.80	0.92	3.08	9.29	14.40	6522	6729	6428	2532
9	67.58	7.42	.....	13.42	0.63	5.18	5.77	15.10	7439	7845	7330	2683
10	60.72	4.30	.....	14.42	2.08	14.68	3.80	16.22	5768	6760	5602	2497
11	72.94	4.50	1.79	11.77	.....	4.50	4.50	13.24	6938	7208	6843	2654

This table affords some suggestive comparisons, to facilitate which a remark or two explanatory of its construction will be useful. In the ultimate analysis of coals the proportions are frequently calculated (as, for instance, in the report for 1872 of Professor Cox, State geologist of In-

diana) upon the dry coal; that is to say, excluding the percentage of the moisture. Thus the analysis (No. 11 above) of the Sand Creek block coal is given in that report, (p. 18,) as follows: Carbon, 76.38; ash, 4.71; hydrogen, 4.71; oxygen, 12.32; nitrogen, 1.88—the previously-given proximate analysis having shown 4.50 per cent. of moisture. To secure uniformity in the table I have reduced these results to the basis of a full analysis, including the moisture. The justice of including the moisture of the coal in calculations of its calorific power would be unquestionable if the moisture were a constant element. This it is not; it varies in amount, according to the local conditions affecting the samples taken. But, on the other hand, some moisture is always present, and an amount not exceeding 5 or 6 per cent. is scarcely too great to be included in an estimate of average quality. Professor Frazer's proximate analyses of New Mexico coals give an average of 3 per cent.; of the Boulder County coal of Colorado, 16 per cent.; of the Evanston coal, 5.83 per cent.; and the average of 93 analyses of Indiana coals, made by Professor Cox, gives 5.87 per cent. of moisture. Now, this moisture is a greater detriment to the heating-power of the coal than an equal amount of ash, since the water requires to be evaporated, while the ash does not. I have, therefore, included in the above table the percentages of moisture as a basis for caloric calculations, though in several instances (notably Nos. 4, 6, 7, and 10) the amount of moisture is perhaps abnormally great, and the calorific power resulting from the calculation may be less than the average of the coal would give. There are, it will be noticed, three columns of calorific powers. In each of these the amounts are expressed in centigrade heat units, and therefore indicate directly the pounds of water which could theoretically be raised from zero to the boiling-point by the combustion of 100 pounds of fuel. The first column is obtained in the following manner: The amount of combined water is found by adding to the oxygen one-eighth its weight of hydrogen; the remaining hydrogen is multiplied by 34.462, the number of heat-units evolved in the combustion of hydrogen; and the amount of carbon is in like manner multiplied by 8,080, the caloric modulus for carbon. The sum of these two products is the number of heat-units generated by the complete combustion of one unit of the fuel containing the given proportions of carbon and available hydrogen. The heat-units due to the combustion of the sulphur are disregarded, in view of the small amount of sulphur, its low calorific capacity, (about 2,240 units,) and the circumstance that it exists partly in the form of pyrites, the decomposition of which still further diminishes the amount of heat from this source, and partly as sulphuric acid, causing a net loss.

The second column of calorific powers is obtained by a similar calculation on the supposition that the moisture is absent. The third column gives the closest approximation to the available heat, and is obtained by deducting from the figures in the first the amount of heat-units required to vaporize the moisture and combined water. This is 537 units of heat for each unit of water.

The last column gives, in centigrade degrees, the maximum theoretical *temperature* to be obtained by the perfect combustion of the fuel. It is calculated in the following manner: The quantity of carbonic acid, sulphurous acid, water and nitrogen resulting from the combustion of one unit of the fuel in atmospheric air is determined, and the quantity of each of these substances is multiplied by its specific heat. The sum of these products, which we may call the temperature unit, is the number of heat-units required to raise the mixture one degree in temperature. Dividing the number of heat-units given in column III by this temper-

ature unit, we obtain as a quotient the number of degrees centigrade through which the temperature of the fuel will be raised, or, in other words, the average temperature of the products of combustion, on the supposition that the initial temperature is zero; that the combustion of carbon and hydrogen is complete; that no superfluous air is admitted, and that there is no loss by radiation and conduction during the process. The calculation may be illustrated by displaying a single example in detail.

We have in analysis No. 1 of the table the following constitution of the fuel: Carbon, 59.72; hydrogen, 5.08; nitrogen, 1.01; oxygen, 15.69; sulphur, 3.92; moisture, 8.94; ash, 5.64. To find the combined water we add to the amount of oxygen the proportional amount of hydrogen, or one-eighth, since water consists of one part hydrogen and eight parts oxygen. This gives us 17.65 combined water, leaving 3.12 of hydrogen available for the generation of heat. But the moisture and combined water must be evaporated by the combustion of the rest of the fuel; and the heat absorbed in this evaporation is 537 heat-units. Hence, to evaporate 26.59 hundredths of water will require (temperature apart) 142.78 heat-units, which must be subtracted from the calorific power in column I, leaving 5,757.22 as per column III, the available amount of heat.

We now proceed to determine the temperature of the products of combustion. A simple calculation, based upon the chemical equivalents, shows that these products will be as follows:

59.72 carbon will unite with 159.28 oxygen, forming.....	219.00 CO ₂
3.92 sulphur will unite with 3.92 oxygen, forming.....	7.84 SO ₂
3.12 hydrogen will unite with 24.96 oxygen, forming.....	28.08 HO
26.59 combined water and moisture.....	26.59 HO
Total oxygen required from the air.....	188.16
Amount of nitrogen corresponding to this amount of oxygen in the air	629.86
Amount of nitrogen already in the fuel.....	1.01
Total nitrogen in the products of combustion.....	630.87 N

The specific heat of carbonic acid, that is, the number of heat-units required to raise a unit of this gas one degree of temperature, is 0.216; the specific heat of sulphurous acid is 0.155; that of steam is 0.475; and that of nitrogen is 0.244. Applying these numbers we have for the heat rendered latent by each substance in one hundred units of the above mixture of gases—

CO ₂	219.00	×	0.216	=	47.304
SO ₂	7.84	×	0.155	=	1.215
HO	54.67	×	0.475	=	25.968
N	630.87	×	0.244	=	153.932
					228.419

That is to say, it will require 228.419 units of heat to elevate the total products of combustion of 100 units of fuel one degree centigrade; or, 2.28419 is the specific heat of the products of combustion of one unit of the fuel. Dividing 5,757.22, the number of available heat-units from the combustion of one unit, by 2.28419, the heat absorbed for each degree of temperature, we have 2.520, which is the temperature in degrees centigrade of the products. It need scarcely be said that the unit of weight employed is immaterial to this calculation. The temperature is the

same whatever the quantity of fuel, provided the combustion takes place as above supposed, and the gases are not compressed.

It should be remarked, finally, that the oxidation of iron in the ash has not been taken into account in the foregoing calculations. The analyses give no means of determining it; but it is certainly insignificant as a source of heat, and its contribution to the resultant temperature would be reduced by the diluting effect of an additional quantity of nitrogen in the air required for its oxidation.

Pure carbon yields by combustion to carbonic acid 8,080 heat-units; and the theoretic resultant temperature of the carbonic acid produced is 2,720°. It will be seen that some of the coals in the table, particularly the lignites of Cañon City, Colorado, and Carbon Station, Wyoming, approach the calorific power of carbon.

Moreover, several of the lignites nearly equal, and that of Cañon City surpasses, the block-coal of Sand Creek in calorific power. Yet the latter is successfully used in the smelting of iron. We are, therefore, led to conclude that high metallurgical temperatures can be obtained from the best lignites of the Rocky Mountains, and that only their physical behavior, which hinders a complete combustion, prevents their use, even in shaft-furnaces. That they can be utilized by means of gas-producers, I think there is no room to doubt.

CHAPTER XV.

THE SEPARATION OF GOLD AND SILVER.

The following interesting and valuable paper on this subject, by Dr. F. Gutzkow, formerly of San Francisco, appeared two years ago in the *Berichte der deutschen chemischen Gesellschaft*, of Berlin:

The usual method employed on a large scale, for a considerable number of years, for separating gold from silver, copper, and other metals, consists in treating the alloy with concentrated sulphuric acid at a high temperature, and precipitating the silver from its dilute sulphuric-acid solution by means of metallic copper, the desilverized liquor being used for the preparation of sulphate of copper. This, however, is in many respects deficient; for, in the first place, there is a large bulk of water required to dissolve the rather difficultly soluble sulphate of silver, and this large bulk of liquid requires, of course, large sized vessels to hold it. Of far more importance is, secondly, the fact that it involves the production of a large quantity of sulphate of copper, a salt now obtained as a by-product in such large quantities, in various metallurgical and other operations, that, owing to its always yet rather limited consumption, this salt is very difficultly salable. The manufacturer has, in most instances, to content himself with accepting a price for this article which often only barely covers the expense of the sheet-copper employed and the copper present in the alloy which has been operated upon. Taking these matters duly into consideration, the author, who, while residing at San Francisco, in California, was for a series of years the manager of the extensive silver-refining works belonging to the San Francisco Assaying and Refining Company, considered it to be of the highest importance to make a radical change in the method of silver-refining just alluded to, and to limit the manufacture of blue vitriol to the comparatively small quantity of the copper contained in the crude, unrefined ingots. It was found unsuitable to substitute sheet-iron for the sheet-copper in the precipitation, owing to the fact that, by the employment of iron, copper is, of course, again precipitated along with the silver, and the separation of the copper from the silver does not admit of any other method readily executed on the large scale than a repetition of the same process again. The author found, however, that the reducing agency of sulphate of iron (green vitriol) can be applied successfully to the solution of sulphate of silver. The process about to be here described has been employed for a series of years in the works above named, and by this process several thousand hundred-weight of fine silver has been produced. It should be observed at the outset that it is not readily possible, for reasons which are not here further alluded to, to work on the large scale with sulphate of iron upon the solution of sulphate of silver in water. On the contrary, it is required to prepare, first, crystallized sulphate of silver, free from impurities, inclusive of metallic gold in a finely-divided state, sulphate of lead, and other substances, insoluble in a solution of green vitriol. The pure crystallized sulphate of silver is next to be acted upon by a hot and concentrated solution of green vitriol. The very hot, turbid, thickish fluid obtained by the action of boiling concen-

trated sulphuric acid upon the silver-alloy under operation is poured into a large-sized cast-iron caldron, containing dilute sulphuric acid at 58° Baumé = 1.617 sp. gr., and previously heated to 110° . A small quantity of water is next added; and after the liquor (having been left at rest for a few minutes) has become clear, the solution is siphoned over into another similar caldron, so placed and arranged as to admit of being thoroughly cooled by means of cold water externally applied. For every hundred-weight of silver refined, 10 cubic feet of the dilute acid (sp. gr. 1.617) are taken. The addition of water just alluded to is intended to reduce the very concentrated acid silver solution to the same density, and the quantity of water to be added may be therefore inferred from this explanation. The addition of water is intended, however, to effect something else yet. Precipitates of sulphate of lead and sulphate of silver are formed, and the latter does not become quite permanent until, first, all the lead which was in solution is precipitated; and, moreover, these heavy precipitates greatly aid the throwing down of all substances which render the liquid turbid, and especially the gold. By the means just described, a clear liquid, quite free from any lead and gold, is far more rapidly and completely obtained than by the method usually applied, viz, the pouring of the very concentrated sulphuric acid silver solution into water.

The liquid, having been cooled in the manner just alluded to, and reduced to a temperature of from 30° to 40° , is, by means of a pump, transferred again to the upper caldron, there to be used again as acid at 38° B. At the bottom of the caldron in which the cooling took place, the sulphate of silver will be found deposited, forming a hard, yellow-colored, crystalline crust about 2 inches in thickness. This crystalline mass is tolerably free from adhering acid; but at the deepest part of the vessel will always be found some strongly acid mother liquor, and this acid is to be again used to dissolve a fresh quantity of silver. The crystalline mass, consisting of sulphate of silver, is removed from the caldron by means of iron shovels, and placed on the perforated false bottom of a wooden box lined inside with lead, and placed on wheels, so as to be capable of being moved from one place to another; between the false and real bottom, a tap is placed for running off liquid. Along with the crystals, and adhering thereto, is a red powder, chiefly consisting of sulphate of copper. The next step is to run through, or, more correctly, pour over, the crystalline mass a very hot and very concentrated aqueous solution of protosulphate of iron (green vitriol.) The salt of copper is first dissolved, and therefore that liquid is run off separately, afterwards to be used for the preparation of sulphate of copper. As soon as the solution which runs off begins to exhibit the pure brown color due to sulphate of peroxide of iron, the solution is caused to run into a large, very shallow vessel, in which, on cooling, the largest portion of the silver-salt is decomposed, and some metallic silver is deposited in a spongy state, which substance is collected and placed on a large filter. The greater portion of the crystalline mass of sulphate of silver which has been placed in the box is, however, converted slowly on into a dense coherent mass of metallic silver, and the reduction may be considered complete as soon as the vitriol solution which runs off has assumed the green color it originally possessed. The metallic silver is next washed with pure hot water, then pressed in a hydraulic press, and lastly melted.

The iron solution which has collected in the large-sized shallow vessel just spoken of, after having become sufficiently cool, is poured or run into a lead-lined tank wherein some scraps of old sheet iron are

placed, and is thus again reconverted into sulphate of protoxide of iron, to be used at a subsequent operation. The small quantity of silver and copper which are separated in the metallic state by this last-mentioned operation is collected from time to time, and put along with the crystals of sulphate of silver contained in the vessel, wherein they are to be exposed to the action of the sulphate of iron solution. The copper is almost immediately converted into sulphate of copper on coming into contact with sulphate of silver. On the large scale, for every hundred-weight of silver reduced from the sulphate 20 cubic feet of green vitriol solution are required.

CHAPTER XVI.

THE PLIOCENE RIVERS OF CALIFORNIA.

The Pliocene period,* to which the deep placer gravels of California are referred, is the concluding epoch of the last great sub-division of geological time, the Tertiary, when the mammalian animals came, that soon, according to the Darwinian school, culminated in the upright, walking, and articulating mammal, man.

The significance of these rivers, *geologically*, is in virtue of their furnishing the oldest authenticated records of fossil man; *economically* and *historically*, in having furnished the gold that extended Anglo-American sway around the world, and created new moral empires on the Pacific, developing several noteworthy features of important future bearing in the march of man to his nobler destinies.

To set forth more clearly that with which I have now to deal, the Tertiary is the period when the hard woods, the oaks, hickories, maples, willows, and palms came, and succeeded in crowding out the cycads, half-ferns, half-palms; when the salmon, perch, and herring came, and succeeded in crowding out the ancient hard-scales, called ganoids; when the reptiles that were oviparous or egg-laying gave way to viviparous mammals that hatch the ovum of their young internally, carry it a long while, as its finer nature requires, and bring it forth alive. Mammals of the same *families* that are now living were universal; but the particular species of mammals, as well as birds and reptiles, are every one extinct—our sure guide as to the ending of the Tertiary.

Vast physical changes in the surface of the globe.—A little tell-tale shell, very characteristic of the Eocene or early Tertiary, is the nummulite. It is the coin of the Tertiary which all the mammals might attach to their watch-guards, for it tells you that in or after the Miocene or middle of the mammalian period, just preceding the gravel period of the rivers, and since these rivers were eroding or cutting in their ancient channels, a portion of the Alps were uplifted 10,000 feet, and the Himalaya Mountains and plateau of Western Thibet were uplifted 16,500 feet. The greatest mountains of the globe and the grandest of plateaus accordingly achieved their height, by the testimony of this little shell of the sea, from about, or not long preceding, the date of these rivers.

And if we can prove that the stone implements of the deep placer mines are *ever* from under the lava, it follows that man was the joint experiencer with the extinct mammals of these vicissitudes, and that he alone was enabled to survive them, in virtue of his well-known independence of geographical range and conditions.

Historical and geographical comparisons.—The "seven hills" of Rome are of the same age as our gravels, Pliocene, but marine. It is worth mentioning in this connection that Cuvier's great fame was based upon the fact that he it was who first discovered in the formation on which

*This chapter was prepared, at my request, by Mr. Amos Bowman, of San Francisco, whose experience in connection with the California geological survey makes him high authority on the subject. It is published without change. Nor have I thought best to alter, in the previous chapter on California, statements derived from local observers, and involving some theories of continuous gravel channels, which Mr. Bowman, probably with better reason, rejects.—R. W. R.

Paris stands these Tertiary extinct mammals, so important as bearing upon man's advent, and reconstructed and described their strange antediluvian forms. All the country in which are the Aral and Caspian seas in Asia is Pliocene, and all Russia is cotemporary sea-mud.

Animal life.—After the Pliocene our volcanic period, and the ice period, followed; and the great elephants came, the American and the hairy one of Russian fame. This country was full of both. They lived in herds, and were twice the size of the largest elephants now living. Our country had horses and oxen in proportionate size, and was full of real lions. England and Germany had bears larger than the grizzlies. Owen's great fame, again, was based in his discovering and describing these beasts of the post-Pliocene in England.

Human remains are abundant the world over in association with these latter animals that are now also extinct, but in the post-Pliocene there were other mammals that survived besides man. Here, then, we are sure that man was able to survive great changes that destroyed nearly all his companions.

We are now prepared for a closer view of the ancient drainage slope of the Sierra Nevada.

ANCIENT DRAINAGE SLOPE OF THE SIERRA NEVADA

Tertiary tailings.—The great valley of California is the child of the "Golden Mountain."* Its Pliocene sea-trough is now a vast agricultural plain, oak-dotted, and filled to 1,000 feet in depth and more with gravel. We know this by the Stockton artesian well, showing golden sands to the bottom.

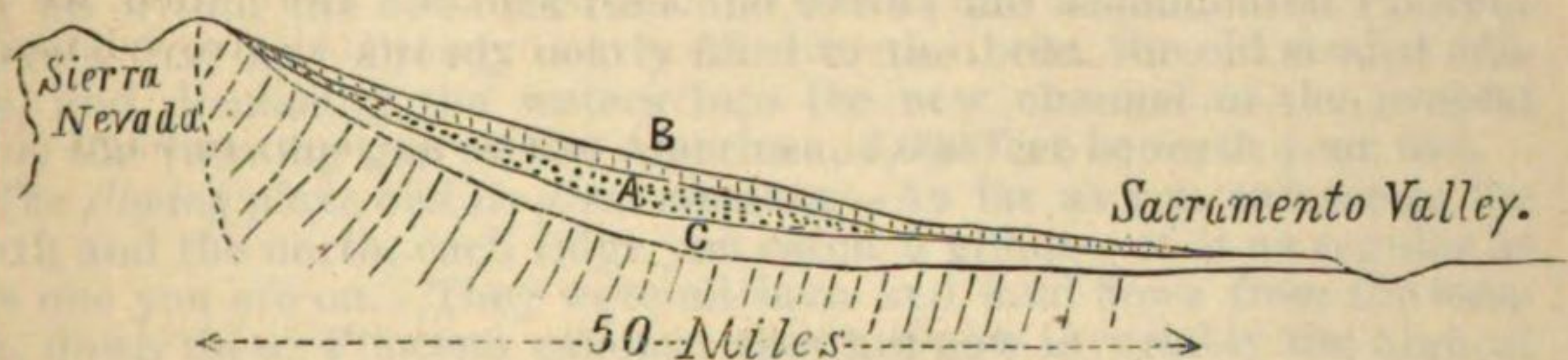
Relation to the sea.—This valley is not yet quite filled up, though, the gates in the parallel ribs of the State were so narrow at Carquinez Straits as to hold back all the coarser detritus within the Diablo range. Suisun Bay and the tules, even as far up as Sacramento, show considerable spots of land surface yet under the sea level. The Bay of San Francisco itself has been locally filled up—as far as the Santa Clara and Napa and Solano valleys extend—affording alluvial fields for delightful Post-Pliocene homes.

Denudation.—We may calculate the vast quantities of subaqueous detritus, and read by the testimony of the ancient rivers, and the present river-cañons, where it came from; calculate by the thousand feet and more of valley-gravel in the great Alta California Basin, for at least 1,000 feet of denudation of the western slope of the Sierra Nevada, over the whole fifty miles of sloping area, from its summit to its base.

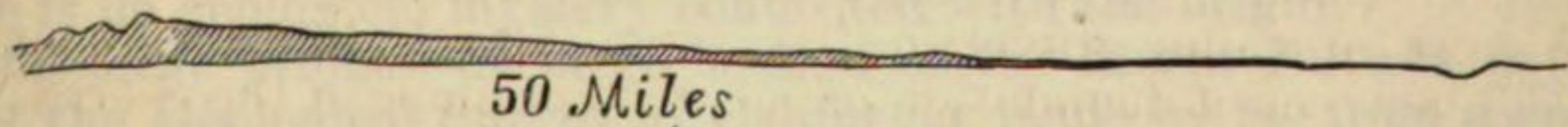
Standpoint, mid-slope, the departed sea.—Standing upon the top of some jutting rocks like the Hog's back in the Central Pacific Railroad surveys, about mid-slope of the Sierra Nevada, and looking westward, before you lies, in plain sight, the whole valley of the Sacramento, in one grand sweep of vision, embracing three hundred miles, or six degrees of latitude, and as far west as the Coast Range, or about 30,000 square miles of country, steeped in the mellowest afternoon light, and set in a framing of forest stems and green.

During the flood season let it be—when the Sacramento is a Nile—like a dream of vivid reality of the "early times" that are involved, geologically speaking, the glistening expanse suggests to the common-

* The appropriate title, referring to the Sierra Nevada, by which the Chinese, in their conversation and "literature of the day," continue to designate the State of California



Cross-section of the Sierra Nevada—see pp. 379, 384.



Profile from the Sierra to Sacramento River, vertical and horizontal scales equal—see p. 379.

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est observer the story of the departed sea of the period of the ancient rivers.

The gold-mining "flats."—The railroad threads the wonders of the chapter which I have not the space to write. An afternoon's ramble, within the capacity of a child, will take you to the spot I have named. Experienced eyes may follow, in many places, the forest-clothed shelves and benches of the Pliocene rivers near these mountain tops, the favorite haunts of birds and animals of the Sierra Nevada in their wild state, and the sites of all the mining-camps, involving other individualities and scenes of our own "early times" of mining.

The lid of the casket.—You will follow in your walk a mountain-crest, as continuous and regular on top as a railroad embankment. It is the volcanic divide, or capping; an ancient lava and mud-flow that filled up the extinct river's bed which gave it direction; covering in and sealing up within the bed-rock rims and basins the accumulated Pliocene gravels that had already nearly filled to the brim the old eroded cañons, and displacing the waters into the new channel of the present time, the yawning gap of the American, 3,000 feet beneath your feet.

The sloping plane and its great erosions.—As far as you can see to the south and the north, each ridge you catch a glimpse of is as regular as this one you are on. They were all lava and mud-flows from the summit, down these Pliocene cañons; they are now invariably the highest mountain-ridges as stated.

In sheer height above the present river-beds, only a gun-shot removed, they exceed in altitude the average summits of the Alleghany Mountains above the sea, a hundred miles away from them.

Yosemite and Jehovah Gap.—In line with the general slope of the Sierra are the tops or dividing-ridges of a score of cañons like this one of the American, each of a depth and grandeur as vast as the mortal eye can compass. For even here one must stay and study before one can realize the sublimities of space and distance. Look at Yosemite. Painters and poets may do much to convey an idea of these sublimities of scenery, but short of seeing the reality not even Milton's imagination could portray such space as that through which the outlawed horde of heaven fell. Or look down from the observation-car of the Central Pacific Railroad as you come down the slope just below Shady Run, into the depths of the Great Jehovah Gap* of the North Fork of the American.

There is no geological mystery connected with the origin.

The fluviatile profile.—A large section of the Sierra Nevada in the office of the Geological Survey of California, made by me from a great number of vertical and horizontal measurements in the course of my examination of the ancient rivers, discloses near mid-slope, in the modern erosion, the simple cycloidal curve (C, Fig. —,) peculiar to the fluviatile profile under the condition of erosion.

In the ancient erosion, or Pliocene cañon, a precisely similar curve, (A) less deeply cut by a difference of 1,500 feet, is seen, expressive of less time, less grade, or less water—one or several of these three *elements* of erosion: I need not proceed to demonstrate, in this connection, which. The intermediate volcanic outburst marking the close of the Pliocene was the turning-point, and furnishes us with the key to the history of the Pliocene rivers, for we find in the fluviatile section of

* This name was given not irreverently to the gap near the Hog's Back (where the post-Pliocene erosion measures 3,000 feet vertical) by poor Paul Grabble, a character of the mines, eloquent and crazy, who lived within the gate of its sunset shadows, and reared there an orchard.

the period, as marked by the volcanic capping, for all time and for all the world to see, the profile of a river of the plains comparatively very nearly a straight line.

Rationale of gravel.—The filling of eroded cañons with quartzose gravel from the surrounding country rock, physical geology teaches us, is due to the inadequacy either of the volume of water, or of the fluviatile grade of the rivers in question to clear themselves any longer. Farther on I shall show what changes of level took place at the time along the base of the Sierra Nevada and outlying islands of the period, as marked by the sea-surface itself, and its living animals, in enduring hills co-extensive almost with California; I refer to the area delineated as that of "tertiary islands and sea-bottom," in the light of the Pliocene terraces of the San Mateo, Livermore Valley, and Napa and Solano hills.

Grade and rainfall.—To what extent these changes of level were attended by alterations of rainfall or of the grades of the Pliocene rivers of the Sierra Nevada I need not discuss at any further length than to state the fact that the rivers carried, during the earlier filling period, enormous boulders, sometimes 10 feet in diameter, implying steep mountain grades, and thenceforward a tolerably regular average of boulders, less than five inches in diameter, up to the levels of the lava cappings. With these facts in plain view, any miner may study for himself whether altering rainfall or altering grades had most to do with the formation of the gravels he is engaged in dumping, by the agencies of hydraulics and steeper grades, into the nether space.

THE PLIOCENE GULF OF ALTA CALIFORNIA.

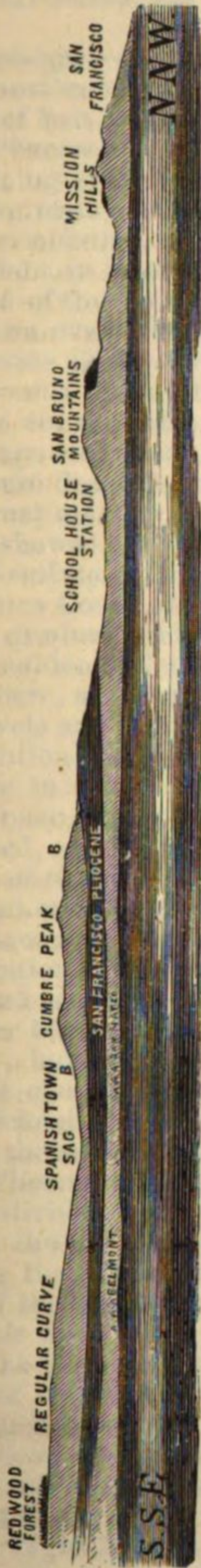
Picture to yourself now a vast inland sea or gulf, separated from the ocean by a row of islands and peninsulas, along whose length it stretches parallel. Opposite the middle of this gulf or sea the range of hills along the coast, or Coast Range as it is known to us, sags down beneath the water, so that only the tops emerge, in the form of points and islands.

This was the Pliocene gulf of Alta California. Its waters stood on the flanks of the Sierra Nevada to an altitude of probably near 600 feet; near the level of Shasta City; above Horse Town; above Piety Hill; not far from Oroville and Turnbucto; somewhere between Pino and Auburn; above Knight's Ferry, and not far below the base of the Calaveras and Tuolumne Table Mountain. Abundant data are at hand to enable us to map the outlines of this Pliocene sea, if only a little pains were taken to follow out the continuations in the field.

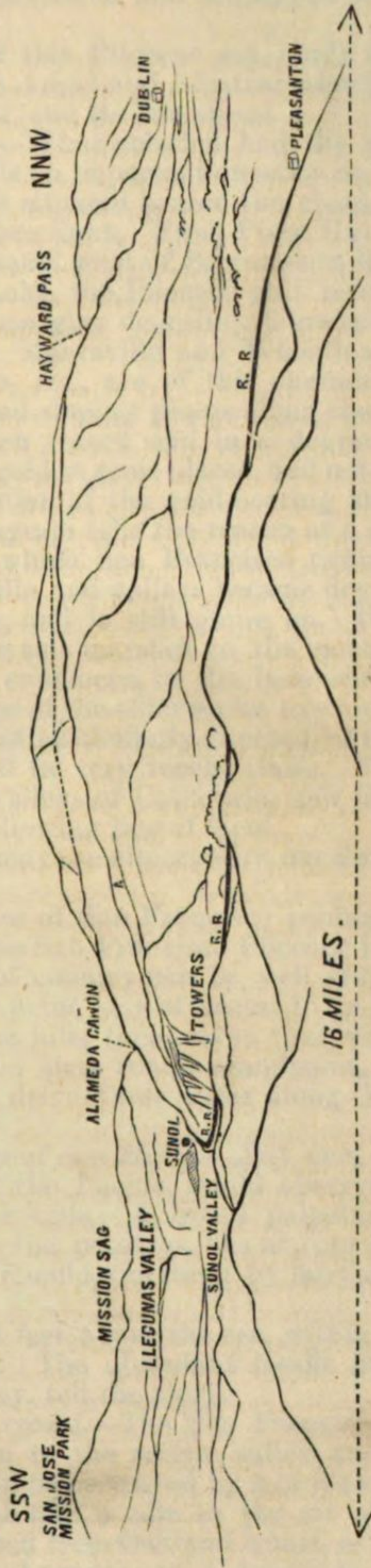
Islands of the period.—The principal islands at the straits connecting the inland sea with the ocean were Tamalpais and Diablo. The peninsular points were Saint Helena on the north, and Mount Louis, of the Hamilton group in the Diablo range, toward the south.

In the course of the vicissitudes and changes above referred to that followed the erosion of those famous rivers, and the piling up of their golden gravels ages ago, when the elephants and mastodons, the tapirs and camels, ceased to inhabit the palm forests that grew on their shores, and the huge turtles ceased to wallow in their shallows, (for we find the woods and bones of all these imbedded,) the sea departed, that until then washed the fiery buttes and the loftier San Francisco, Livermore, Solano, and Napa Hills, to the base of Mount Saint Helena.

Geology tells no unsupported story. There is always left for you, somewhere or other, a sample-piece, from which you may reason induct-



Sectional view of San Francisco Peninsula—see p. 381.



View west from Pleasanton Hills, Alameda County, Cal.—see p. 382.

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ively or by analogy; and from that on to every correct conclusion, evidences are found, not singly, but scattered and multiplied a hundred-fold.

A prototype.—For a prototype of this Pliocene sea, study the bay of San Francisco of our day, with its Angel and Alcatraz islands, its peninsulas of San Mateo and Saucelito, and its Tamalpais.

The Pliocene Gulf of California.—What relation had the sea to the gold-mining gravels of California, is an important question on which the following facts observed in gravels situated nearer the coast, and only in part auriferous, will throw further light. From Piety Hill gold-mining district in Shasta County, situated west of Sacramento River, near the head of the valley, to Tulare Lake, the Pliocene gulf received from the rivers everywhere along its margin, deposits of gravel, forming subaqueous shallows and washes. Marysville and Wheatland Knolls, and Poverty Ridge at Sacramento, &c., are of this character. Remnants of considerable hills, or broad sloping plains along the foot-hills, of this age and character, have been traced and in a degree mapped. Why these deposits are mined for gold in some places, and not in others, is no great mystery. The distribution of the gold-bearing slate formation as shown on the foregoing diagram tells the reason at a glance.

Land-making.—The process by which San Francisco peninsula, and the Contra Costa and Alameda hills and valleys became dry land, was simple, gradual, and commonplace, and is still going on. It was not one of sudden violence. From the salt marshes to the mountain-tops, everywhere, are found systematic evidences, in the loosened material, the gravels and sands in the surface of the older rocks, to which geological attention has hitherto been most particularly directed, of the ocean's presence in successive stages, and in very recent times. What were islands once among the hills and valleys of California, now farmed and populated, can be traced by the following line of facts.

Birth of the coast counties.—We may see almost with our own eyes the birth and creation of the coast.

The accompanying sectional view of San Francisco peninsula shows the situation and significance of the San Francisco Pliocene hills. The scope and scenery of this section of country can be well studied from the older San Bruno Mountains, a point easy of access in an hour from the city; but to get to the Pliocene hills themselves, that were in the Pliocene course, under water from that island standpoint, one must go to School House station, and drive three miles along the Laguna road to the southwest.

The Pliocene plateaus and terraces of San Mateo.—Any one, on attaining the divide here, in full view of the Pacific, would observe a peculiarity in the scenic outlines of the hills. A broad palpable plateau, yielding the Italian renter easily-won potatoes, lies at your feet in the glory of the afternoon sun of the Pacific, tintured by fairyland clouds in the far west.

All the highest hills, some 700 feet above the sea, within five miles radius of this point, are Pliocene. The abundant fossils in them, as determined by the geological survey, tell the story.

Simplicity and regularity of the record.—The San Francisco Pliocene and its subordinate terraces, down to the recent valley and the salt marshes of the sea of to-day, should be portrayed by a bird's-eye sketch, as they might be seen from a point half a mile in the air above Goat Island. The same can be recognized from Oakland wharf, or anywhere along the railroad thence to San Leandro, in a favorable afternoon light. What is most remarkable in these, is the testimony they bear

of the exceeding regularity and simplicity of the movement upward, whereby the waters of the sea were caused to depart. The terrace lines show unequal movement, sagging a little about the road from San Mateo to Spanishtown, and southward rising again up into the redwoods near the summit of the peninsular ridge, opposite San José.

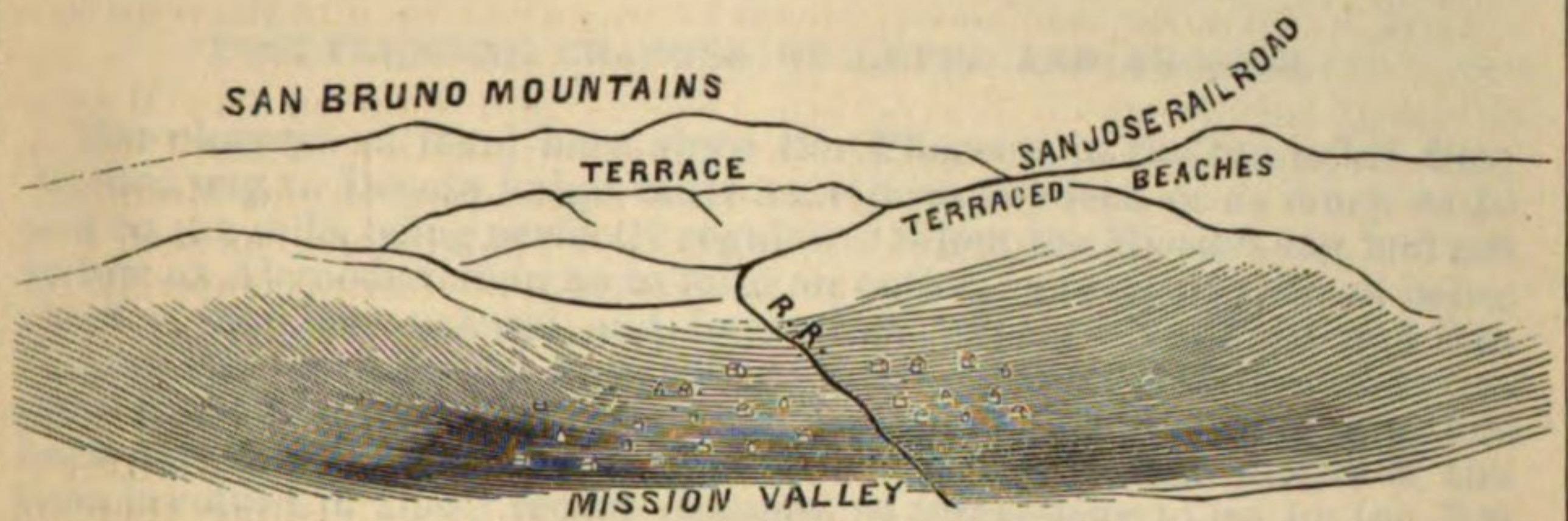
Local peculiarities.—Wave-worn beaches and flats on the Mission hills overlooking San Francisco, show the continuation of the Pliocene sea-levels to our very doors. The terrace in the San Bruno Mountains which gives scenic individuality, in the soft blue distance as seen from San Francisco, is not, as might be expected, of detrital material, but of rock as hard as the Pliocene. It appears to be a terrace of marine abrasion, rather than of subaqueous deposit.

In the Diablo Range.—The Pliocene sea lines so plainly marked on all the highest hills of the peninsula of San Francisco, are not wanting of obvious continuation into the interior. Toward establishing their immediate relations with the Sacramento and San Joaquin Valleys, I have sketched the annexed diagram, being a view west from the highest hill of the Pleasanton Gravel Range in Livermore Valley, Alameda County. The importance of establishing as near as possible, from such data as are below set forth, the exact altitude on the flanks of the Sierra Nevada, of the Pliocene sea into which flowed the ancient rivers of California's gold-mining pride and greatness, is so obvious that it need hardly be alluded to, for the relations of fluvial forces and conditions to the existing sea plainly constitute the elements of their dynamical history.

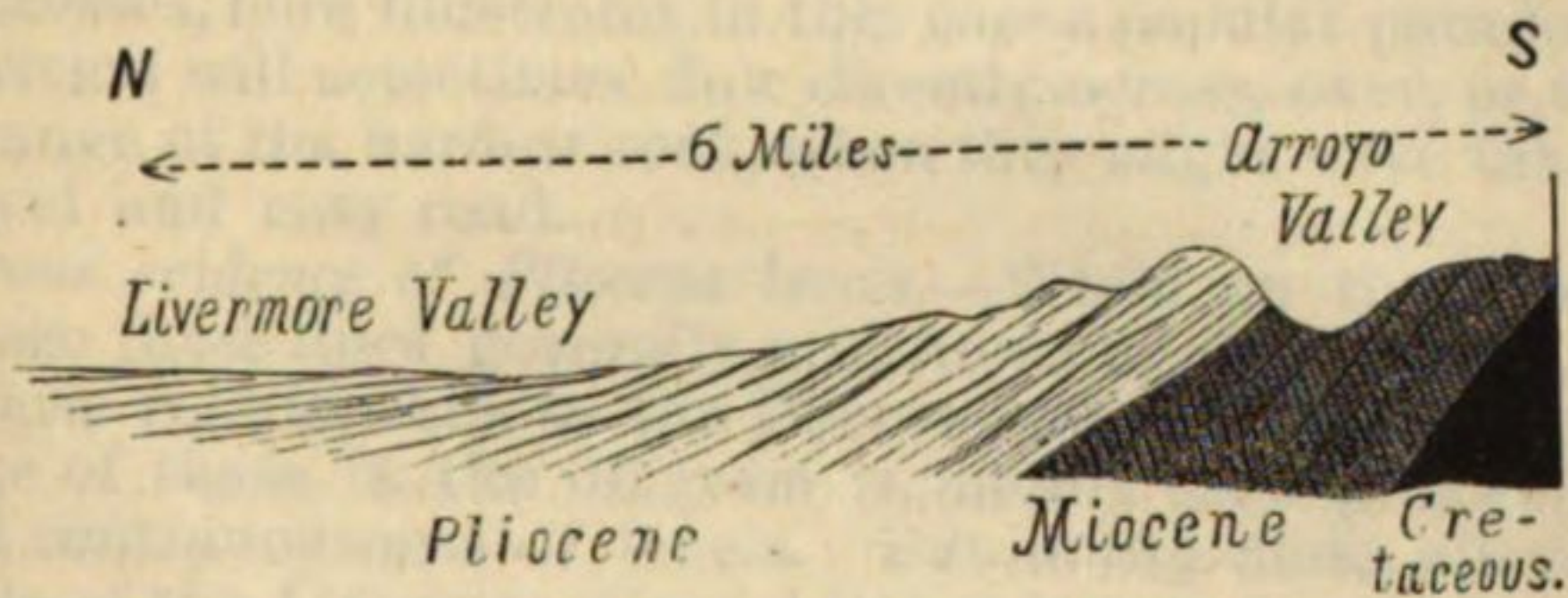
Around the base of Saint Helena.—Applying the same method of inquiry to the Northern Coast Range, I found that all higher hills of Napa and Solano Valleys hold forth abundant testimony of the character of those of Livermore Valley and Pass, the geographical situation of which may make the latter suffice.

A Pliocene island bay.—The view from the summit of the Pleasanton Gravel Range, however, in any direction of the compass, is most rich in suggestive things, scenically as well as geologically. Diablo looms up in noble grandeur to the north, enhanced in its sunny blue altitude by the level perspectives of the intervening valley and a range of Pliocene surfaced hills. Everything in the shape of hill, mountain, and valley here groups itself into forms suggestive of relations to surface-lined hills or terraced valleys. The long-reaching, subaqueous plains, now straight-topped highest hills, having been sliced up into several parallel ranges by the erosions of the Valle and Mocho, (500 feet deep,) give to the excursionist a spice of novelty of situation. Again and again he is reminded, by glimpses of vast slides in the flanks of these gravel hills, that this is only another hydraulic-mining country. Walls of broken gravel 400 feet perpendicular, like that so prominently in sight beyond the Arroyo Valle, near Popes', a few miles east of our point of view, would overtop the tallest of the Sierra hydraulic banks. Go to it, and you will wonder, in the silent solitude, what race of extinct Titans formerly existed and mined here, and ask yourself, what could they have been mining for, or deemed worth sluicing for other than gold?

Lines and terraces in the inside of the Alameda Range.—The diagram shows a series of lines on the inside of the Alameda County hills, just opposite San Francisco Bay and peninsula. The dotted line and first range of hills to the right of Sunol station, being in continuation of the terraced valleys of Llagunas to the south, and the remarkable flat-topped summits stretching beyond Hayward's Pass to the north, present



View south from Leavenworth and San Francisco streets, San Francisco—see p. 382.



Section of south rim of the Livermore Pliocene Bay—see p. 383.

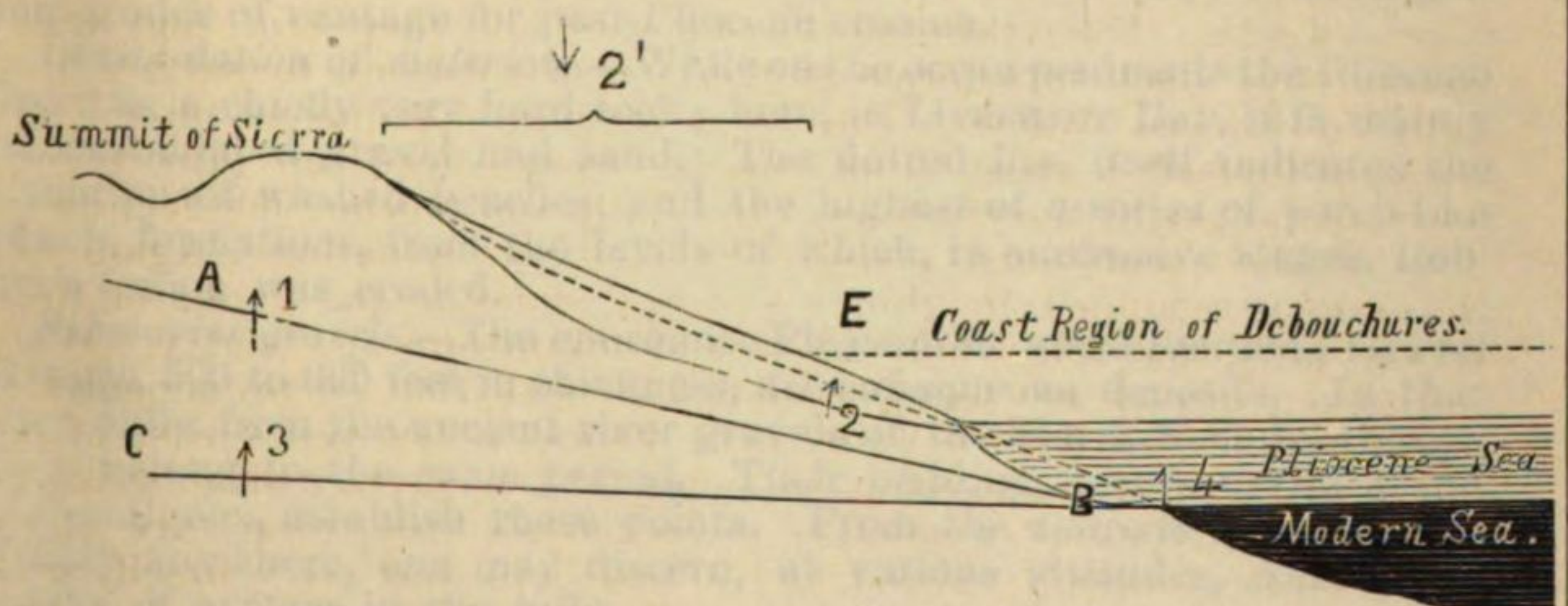


Diagram illustrating successive uplifts, &c.—see p. 385.

to the eye similar slight shovings and saggings out of level (probably still in progress) to those observed in the section of San Francisco peninsula.

POST-PLIOCENE CHANGES OF LEVEL AND EROSION.

The changes of level here since the Pliocene, in the ten miles from Mission sag to Decota bulge, must have been 100 feet, or as much as 10 feet to the mile, being perfectly regular. When the Mission sag had got so low at Alameda Cañon as to form an outlet, more easily eroded, being shorter than the natural and longer one over Dublin Plain and San Ramon Divide to Suisun Bay, the surplus or drainage waters of Livermore Bay united their forces at Alameda Cañon. That abrupt gorge has been cut since the Pliocene. It affords us a pretty good integer of the time involved in these recent changes, so interesting to us, by the 300 feet of erosion shown, at this proximity to the ocean and ocean level of the present.

The hand level applied to the top of Alameda Cañon and Dublin water-shed from points between the two, proved the slight beginnings that determined the outlet in favor of Mission sag. The most simple of natural processes, here illustrates in this case a popular paradox in geology: how rivers will sometimes flow directly across, over, or through a mountain range of the hardest rock, when they might have taken an apparently level and easy road.

Fossiliferous evidence of Pliocene levels.—While on the peninsula of San Francisco these lines generally are shown by fossiliferous evidence to have a close relationship to the Pliocene fossils, the evidence of the Pliocene age of those in the diagram is mainly their proximity to the former, and continuousness of levels. But at Big Slide, above alluded to, the whole of the Livermore Gravel Range is seen to rest conformably upon rocks containing plentifully, fossils of Miocene age.

The top of the gravel range on which the observer of the sketch is supposed to stand, rises—be it understood—to the level of the dotted line, and the San Francisco Pliocene. *In nuce*: a post-Pliocene uplift of at least 900 feet, accompanied by departure of the sea, the latter giving grades of vantage for post-Pliocene erosion.

Consolidation of materials.—While on the ocean peninsula the Pliocene detritus is chiefly very hard rock; here, in Livermore Bay, it is mainly unconsolidated gravel and sand. The dotted line itself indicates the situation of washed beaches, and the highest of a series of porch-like bench formations, from the levels of which, in successive stages, Robber's Cañon was eroded.

Submarine gravels.—The enormous Pleasanton and Livermore Gravel Ranges, 500 to 600 feet in thickness, are subaqueous deposits. In that they differ from the ancient river gravels of the Sierra Nevada, though they belong to the same period. Their bedding, scenic outlines and material, &c., establish these points. From the railroad in Livermore Valley anywhere, one may discern, at various altitudes, consequent marks of system in the hills.

Relations to the sea.—These gravels originated in the very long coast range longitudinal valleys of the Valle and Mocho Creeks, coming into Livermore Valley from the south and east—one of them sixty miles long—where the older hills are largely composed of easily disintegrated conglomerates.

On the San Joaquin side of the Livermore Pass, near Midway station to southwest, a similar terrace formation has been outlined on the maps

of the Geological Survey, showing that the Pliocene gulf levels rose at that point over the flattened hill-tops of the railroad summit at Altamont.

Plutonic agencies.—Let us note what other great changes have taken place, the story of which is found in the records of the Californian hills and mountains.

Shasta was built up to a height of 14,000 feet by the erupting lavas, along with Hood, Reignier and Baker, his brother. The hundred transient volcanoes of the Sierra Nevada, extending south to Silver Mountain and Mono, thenceforth associating themselves with things beyond, flamed up for a period and marked the end of an epoch.

Then the extinct Pliocene mammals, unassociated with living ones, also disappeared from the earth as the climate became icy, and vegetation also materially changed.

The lines of change.—Here is a series of natural events, corresponding to periods of time, as follows, the physical condition of which must be accounted for :

1. The Pliocene or ancient eroding period, when the bed-rock was at Fig. on p. 378 a.
2. The Pliocene filling of the cañons with gravels, or the choking and damming period.
3. The volcanic period of the Sierra, when the gravels were capped.
4. The cold or glacial period.
5. The modern eroding or recent period.

And two things we know concerning these changes, viz :

(1.) This peculiar action of successive eroding and filling is not due to local causes, as it applies with great uniformity to all the streams alike, throughout four or five degrees of latitude.

(2.) Neither was it spasmodic in character, as the conditions of the Pliocene erosion evidently continued uniform throughout many thousands of years of time, and the conditions of the gravel-making epoch followed in perfect succession, and lasted as many thousand years more, before the present cañons began ; that is, we are dealing with secular causes, that lasted throughout centuries.

Conditions of erosion and transportation, rain, and river grade.—We solve the problem of the Pliocene rivers when we ascertain what made the rivers to cease cutting some time in the Tertiary, and to fill up 1,200 feet deep with gravel, &c., and at the end of the Pliocene, as marked by the volcanic outbursts, to renew the conditions of erosion which have given us our present great cañons.

Only two causes of a general nature, such as the case calls for, can be mentioned :

1. Changes in the quantity of rain.
2. Changes in the grades of the rivers, whereby the same or even a larger quantity of water, would yet be inadequate to clear the cañons of the loosened material from the heights where such water was enabled to disengage it, and to bring it as far as the cañons, where the gravels remain to this day.

Hypothesis of a rainless Pliocene.—A rainless Pliocene period, such as would be implied under 1, we know could not have existed, from the rich tropical character of the vegetation found fossil in the gravels. Instead of being a drier epoch than the present one of stupendous erosion, it was at least as rainy, judging by the erosions, and the rivers must have carried at least as much water.

Further, a rainless term would not have seen the washed-gravel boulders loosened and rounded and carried as far as the cañons, and

there dropped. There would not have been any power to make gravel, let alone the carrying of it.

Under the hypothesis of a rainless Pliocene period there must have been three secular changes in the rainfall, the causes for which could be none other than the relations of land to sea-level, indirectly also implying alterations in drainage grades.

Alterations in the river grades by uplift and subsidence.—I accordingly ascribe the filling of the Pliocene cañons with gravel to a lessening of the grades—perhaps attending the uplift of the Coast Range. This latter took place during the Pliocene river period to the extent of *at least* 800 feet near Monte Diablo, that being the difference between the height of the Miocene rocks that were uplifted in the Pliocene and the Pliocene gravels of Livermore Valley and Bay County sea-lines and sea-beaches of the same period, uplifted in the Post-pliocene, or the subsidence of the coast may have had something to do with it.

The general Post-pliocene rise of the land, including the Sierra, furnished the erosive grades for the present cañons.

Alterations in grades by uplift alone.—While in the light of geological history elsewhere, the world over, it may be accepted as highly probable that there were oscillations of the land on the Pacific coast, that is, periods of depression alternating with and subdividing the general upward movement, the question is immaterial so far as the clogging of the Pliocene rivers of the Sierra Nevada is concerned; for the same result as to change of grades would have been brought about merely by alternating periods of uplift affecting now the coast region of the period, now the summit, in the order of the figures on the diagram.

Particular effect of movements.—The movement expressed by (1) and (3) whereby the Sierra was uplifted, was in short interrupted in the Pliocene at the stage of elevation expressed by the line A B; in all other respects it was one and the same movement.

The movement (2) took place in the Pliocene river or gravel period in the elevation of the entire Coast Range, as is elsewhere demonstrated in this paper. But to what extent this identical movement may have extended across the subsiding valley of Alta California, if at all, must be read in the uplifted Miocene or older Pliocene strata by which we read the same movement in the Coast Range, or, what would be equivalent, in such evidences as may exist of a general subsidence of the land, as indicated by (2¹) in the diagram, bringing the sea-line of the Pliocene temporarily to E D.

Final altitude of the Sierra.—Attention being called to the proper methods of observation, it remains only to be said that the alteration of river grades in different periods wherever established will enable us at once to solve numerous other highly important geological problems; as, in this instance, the exact period and the extent of the *final* uplift of the Sierra Nevada.

Instability of the relations of land and sea.—The first grand fact, indeed, established by, and lying at the foundation of, geological science, is the instability of the relations of level of land and sea. Nothing is stationary; the law is that of eternal change. But there in the hills is "The original Book of History, the Unchanged Record." The ocean has its quantum of fluid, but the solid crust is the changing element, forever either rising or sinking in relation to the surface of the sea. The uniform operation of simple laws throughout cycles of time will furnish us with the cause, though no one has yet been able to interpret unequivocally the law or combination of physical laws. Whether the varying conditions which produce these opposite results of uplift and

subsidence reside in the rocks or in the central sun of the universe; whether it be adjacent submarine accumulation that causes the wrinkling of the layers, or the shifting of the earth's belt of equatorial spheroidicity, attributable to cosmical causes, or both.

Alterations on the shores of the Atlantic.—Several alternating depressions and uplifts of the coasts of Europe and America on the Atlantic shores have been well established from the geological records, attested in a thousand localities.

A clear record is requisite.—Now on these Pacific shores the record is even more plain, and far more striking and vast as to uplift. But how are we to know what shores sank or went out of sight under the sea? We are to read the book in those places where it has again risen, and to discover the records, if any exist, of its having been above sea-level before any subaqueous materials were deposited.

The stationary sea gives the perpetual datum, whose position is as well defined by its coast deposits and abrasions as is its horizon to the eye. But I shall not attempt to enter into the facts, however important, now involving broad, continental movements, and bearing only locally upon the problem of the Pliocene rivers.

Altered courses of drainage.—The course of the ancient rivers of the Sierras has been frequently remarked to be "at right angles" to that of the present streams. In any change of bed such as has been here described, there would necessarily be crossings and recrossings at right angles, and all other angles, by the displaced waters. No uniformity of crossing or angle in one direction more than another has ever been attempted to be made out by actual measurement. After devoting considerable pains to the collecting of facts for the determination of this question, the conclusion I have arrived at is that the Pliocene rivers have not varied at all in the *general* course from that of the present rivers; and if such be not the case, the contrary at least remains to be proven.

THE GOLD-BEARING GRAVELS.

The Big Blue lead.—The "Big Blue" lead is a myth, passing through every miner's claim, where there is deep gravel.

The usually received evidence of any ancient stream's crossing a present mountain water-shed into another basin is that there is gravel found on both sides, and that a range of mining camps can be sought out upon the map on the supposed line of an ancient river's course. But gravel is as universal as are drainage gutters. The primary point in the geography of such a river usually is that it runs where there is rich ground—perhaps for sale. All the facts as to irregularities or incompatibilities of grade can easily be ignored in hypothetical cases. The character of the gravel, as to the distance it may have traveled, or the volume of water in the stream which carried it, within broad or narrow valleys, are points too fine to be worthy of attention. So general is the belief among miners in great changes of level since the period of activity of these rivers that no attempt is usually deemed necessary to prove the fact of all facts, universally admitted. No mountain, then, need stand in the way of anybody's Blue lead. The whole country was "hove up."

A lank philosopher of the pick, at Quaker Hill, carried this logic to bed-rock, in expressing to the writer his opinion that "the gravel itself was hove up, for he did not see why the stones might not just as well have been hove up round as in any other way."

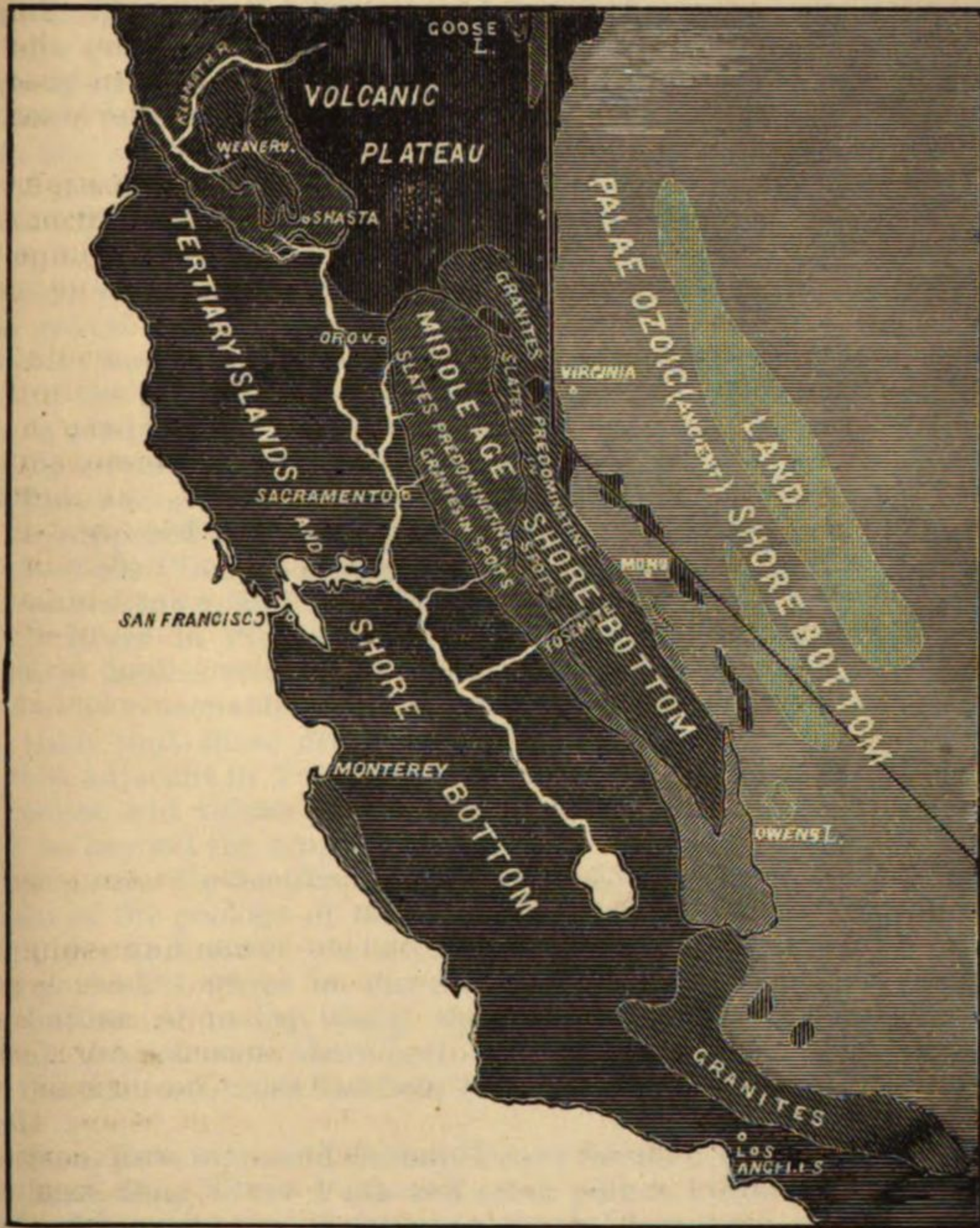


Diagram showing geology and relations of the gold-bearing slates of California—see p. 387.

No faulting—the movements secular and general.—The facts, as far as developed by the State geological survey, establish an almost perfect local quiescence of the beds, shown in the unbroken local continuousness of the gravels. Faults are rare and always doubtful as to the bed-rock. I have recognized but one unmistakably, (at Timbuctoo,) and that may have been due to the operations of bank-blasting and washing.

Whatever changes of level took place on the western slope of the Sierra Nevada after the period of the Pliocene rivers, were not paroxysmal or local, but secular, *i. e.*, they endured throughout centuries of time and were general, as already intimated.

Axes of uplift of the volcanic period.—Yet what variations of drainage the newer volcanic axes of disturbance may have brought forth in general in the region between Lassen and Pilot Peaks, where the older bed-rock of the Sierra sags to an altitude half that of the Central Pacific Railroad Pass, only fifty miles further north, remain to be established, if such variations exist. No one, so far as I am aware, has ever taken the trouble to point them out otherwise than hypothetically by the evidence of the gravel-range in general.

The blue lead in Sierra and Plumas.—Now the evidence of the local origin of the gravels of the region around Pilot Peak and Slate Creek Basin is plainly read in their gradual assimilation to the character of cañon or ravine gravels, as you approach the present water-shed at Hepsidan, under Pilot Creek. And the Plumas gravels may as reasonably be supposed to belong to the ancient Oroville and Spanishtown gravels of the Pliocene Feather River, which loses itself under the lavas near Spanishtown, and to be identical with the present drainage of the Feather River in Plumas County, as with any other drainage-basin, fifty miles farther south on the general slope of the Sierra. Certainly, this is more reasonable until the contrary has been established by other facts than that there are simply gravels in both Sierra and Plumas Counties, adjacent in Yuba and Feather River Basins. A further study of Pliocene and volcanic dynamics in this region, though interesting, would be beyond the scope of this paper.

Whence came the auriferous gravels of California?—The accompanying diagram of the geology of the gold-bearing slates, with their relations to the older and newer sea-bottoms or land, will tell the story.

The unshaded white in the accompanying diagram represents the ocean-bottom of to-day, along shore; the lightest shading, not cross-hatched, the paleozoic shore-bottom in the early or dark ages of geology; the lightest, cross-hatched, the land, or the Pacific coast of that period.

Silurian, Devonian, and Carboniferous fossils brought by Mr. Clayton, and others, from Silver Peak and other points lithologically related in Nevada, have determined for us in general terms the great fact as represented.

The Middle-age shore.—The intermediate one, between the lightest and darkest shadings of the sketch, is the one which concerns us most. It represents in general the area of the auriferous slates. A portion of this shading, it will be observed, is done by lines sloping down towards the left; this represents the off-shore or deep-sea mud which washed down from the Paleozoic or ancient shore in the Middle-age or Reptilian period of geology that next followed the Paleozoic time, or age of Fishes.

Islands and shallows.—The area so shaded was dotted by islands from

which came the conglomerates we find interspersed here and there in the slates, or muds as they were.

Another portion of the same general tint, it will be observed, is shaded by lines sloping down towards the right, this and the last mentioned having a close relationship to each other. This is the area of predominating granite which was once probably pretty generally covered by slates, which were accordingly subjected to all the vicissitudes attending the uplift of a granite mountain core, that of the Sierra Nevada, showing only spots of slates, as represented. The slates are mostly gone; they would naturally have been less thickly bedded so close to the middle-age shore.

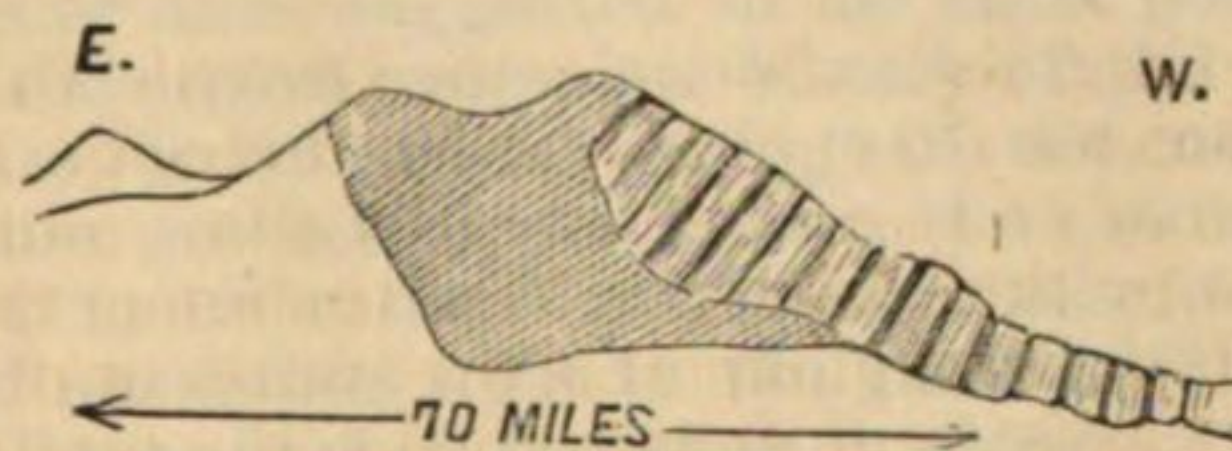
A transverse break and sag.—Between the Oroville Table Mountain and Piety Hill (near Shasta City) gold-mining districts, the slate or gold formation sags into or crosses Sacramento Valley, and is partly cut off, partly only exposed by the deep erosions of the upper Sacramento; being covered at the surface throughout this fifty miles of distance by a broad sheet of lava from Lassen and Shasta Peaks, the tabular cliffs of which, as plainly seen from the railroad, designate the shore-line where these lavas broke into the Pliocene sea.

Deep-sea mud and mountain dome.—That the slate-forming muds were deposited in pretty deep water throughout a long period of time, we have good reason to believe, from their consistency, and from their vast thickness. No careful geological measurement of the thickness in feet has ever been attempted with satisfactory results. Yet it would seem that in the extreme simplicity of the regularity of the bedding of the slates as here indicated along the entire western slope of the range, we should not find it difficult to hit upon the precise method of granitic uplift whereby the off-shore mud-strata became shaped into a dome of unparalleled sublimity, presenting to our view a base or section of seventy miles, and an altitude of 8,000 or 10,000 feet.

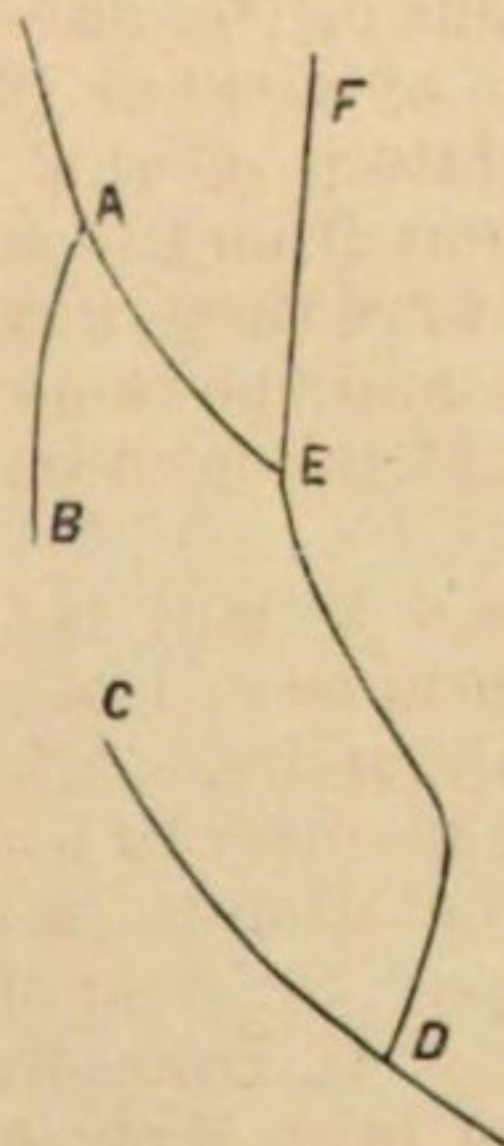
Type of relations.—The relation of this Mesozoic formation to the Paleozoic shore becomes obvious from the accompanying diagram. The granite island centers as they were then in the axis of the Sierra Nevada, before the uplift of these beds, had the same relation to the Pacific shore of the period that the granite Farallon Islands have to the Pacific shore of to-day.

Axial geometry of California.—It will be observed that the axes or efforts of uplift developed a form like this. A valley was formed opening northward like Eel and Salinas Rivers, as if intended to connect with the Klamath (see the striking identity of axis) and drain into the ocean at its mouth. But the Siskiyou Mountains near Weaverville developed a split or spur, A B, to seaward, in sympathy with the Monterey and San Francisco granitic arms, C D, from the Tejon, thus backing the waters from what would have been their original natural course, and forcing them to find a way by the lowest sag, B C; laying the foundation for the future topography of the great California Valley, itself a valley of depression.

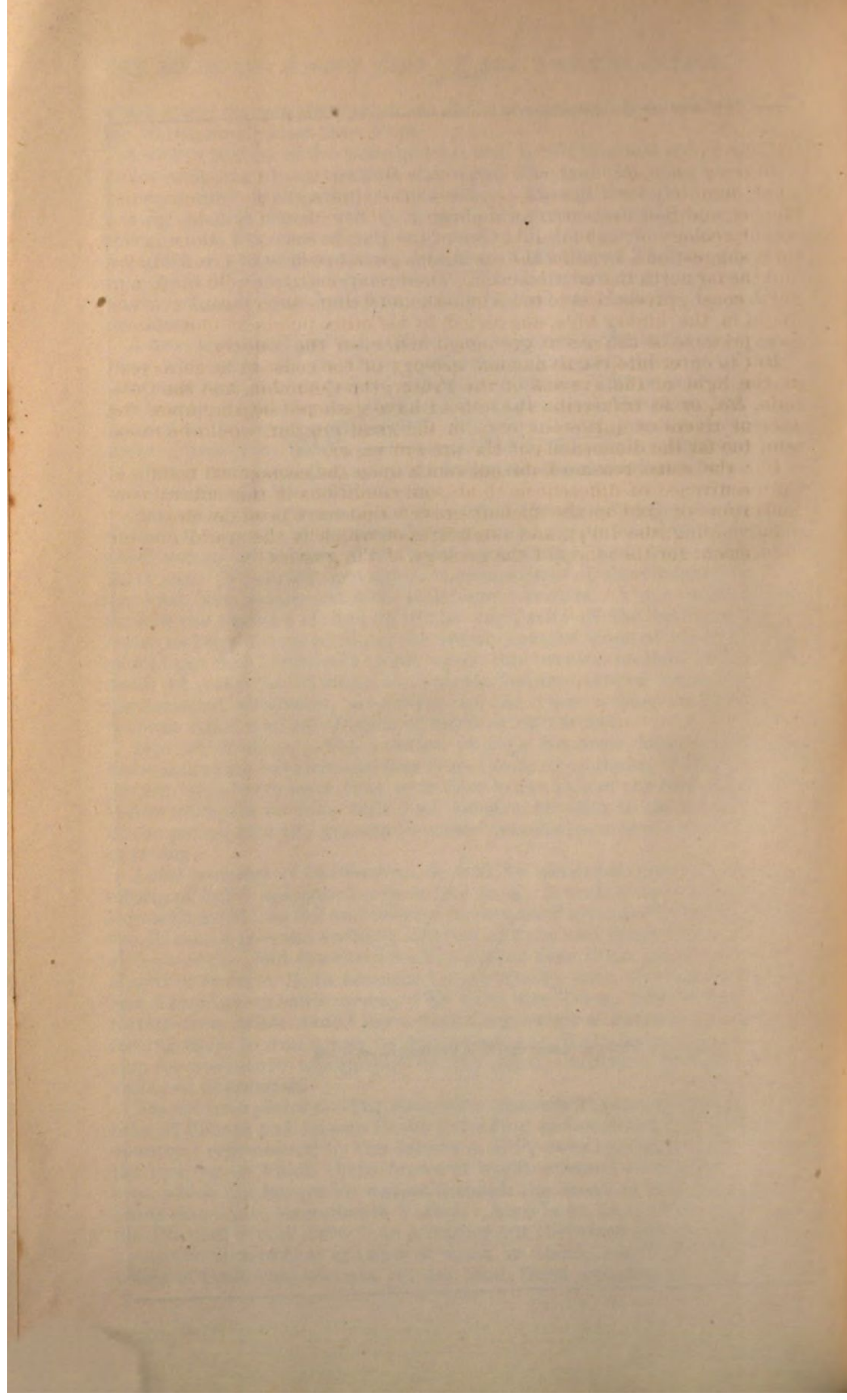
The volcanic plateau.—The extensive (scarcely explored) volcanic plateau of Shasta and Lassen Peaks extending to Goose Lake, (the Modocs' country,) represented by the letters A E F, owes its origin primarily to the manner in which these forces of uplift affected that intermontane area which discharges its waters through the break or sag of the auriferous slates into Sacramento Valley. Ages later, in the Tertiary, when the Pliocene rivers were done scooping out their treasure-chests for the hydraulic miners that are now at work in them, and when the great valley of California was not yet dry land, there were further changes of



Relation of Mesozoic formation to Palaeozoic shore—see p. 388.



Skeleton plan of uplifts in California—see p. 388.



level, interesting to consider in connection with this plateau, the history of which, as read in the Pliocene gravels, is only the later history of the auriferous slates.

Bearing upon the northern auriferous coast-gravels.—I have gone somewhat definitely into the coast-gravels near Monte Diablo, Mount Saint Helena, and San Francisco for a purpose. They furnish the clew to the recent geology of a thousand miles of the Pacific coast. Following out their suggestions, I visited the auriferous-gravel regions of Trinity Basin and the far north British Columbia. Their relations to the gold-bluffs and north coast-gravels, and to the Klamath and Trinity subaqueous gravels, found in the higher hills, suggested to me other points of importance, as expressive of the recent geological history of the country.

But to enter into the dynamical geology of the coast at large, as read in the light of the gravels of the Fraser, the Columbia, and the Colorado, &c., or to transcribe the notes I have gathered bearing upon the ancient rivers of auriferous note in the great interior, would be to extend too far the dimensions of the present paper.

For the same reason I do not touch upon the economical results of the occurrence of different methods and conditions in this natural concentration of gold in the ancient gravels that have been developed by placer-mining, the fuller understanding of which is the world's ample inducement for the study of the geology of the gravels.

CHAPTER XVII.

HYDRAULIC MINING IN CALIFORNIA.

The origin* of this branch of mining dates back as far as the spring of 1852, and illustrates the old adage, that necessity is the mother of invention. The crevicing knife and spoon had done their duty; the gold-rocker was generally displaced by the "Long Tom" and "Grizzley," and these again were superseded by long lines of sluice-boxes, and, *pari passu*, the fissures and crevices in the exposed or denuded bed-rock on the river-banks were relieved of their gold-nuggets; the shallow ravines were mostly worked out; rich gravel "leads" were followed into sides of hills or mountains, hiding themselves under apparently worthless masses of earthy matter, the height of the latter increasing with every step onward, and the miner saw that neither "stripping" nor "ground-sluicing" could secure to him a proper reward for his labor.

Besides this increase in labor and decrease in pay the frequent occurrence of accidents by the caving of banks urged the adoption of other plans for working. Tunnels and drifts were started in many places; shafts were sunk and gold-bearing strata of gravel were found one below the other, the richness generally increasing with depth. The richest deposit was worked by drifting, and the mine was abandoned as worthless after this was extracted.

Thus stood matters in the spring of 1852, when a miner, whose name is not remembered, put up a novel machine on his mining claim at Yankee Jim, in Placer County. This machine was very simple. From a small ditch on the hill-side a flume was built towards the ravine, where the mine was opened; the flume gained height above the ground as the ravine was approached, until finally a "head" or vertical height of 40 feet was reached. At this point the water was discharged into a barrel, from the bottom of which depended a hose, about 6 inches in diameter, made of common cow-hide, and ending in a tin tube, about 4 feet long, the latter tapering down to a final opening or nozzle of one inch.

This was the first hydraulic apparatus in California. Simple in design, dwarfish in size, yet destined to grow out of its insignificance into a giant powerful enough to remove mountains from their foundations. The news spread among the miners, the wonderful practicability of the new invention was at once acknowledged, and, wherever circumstances permitted, a "hydraulic," the name adopted for the novel apparatus, was "rigged."

Improvements suggested themselves from the beginning. The hose, made out of green cow-hide, rotting under the steady exposure to water, became very soon not only offensive, but altogether useless. Some old sailors adopted sailcloth, or heavy canvas, as a substitute; and the sail-maker's trade was called into requisition at every mining-camp.

* This chapter was written by Mr. Charles Waldeyer, of Cherokee, Butte County, California. My own share in it amounts to nothing more than a slight revision and condensation, incidental to the preparation of the manuscript for the press. I need not vouch for Mr. Waldeyer's thorough acquaintance with this subject in all the bearings of practice. The internal evidence of his work is conclusive on that head.—R. W. R.

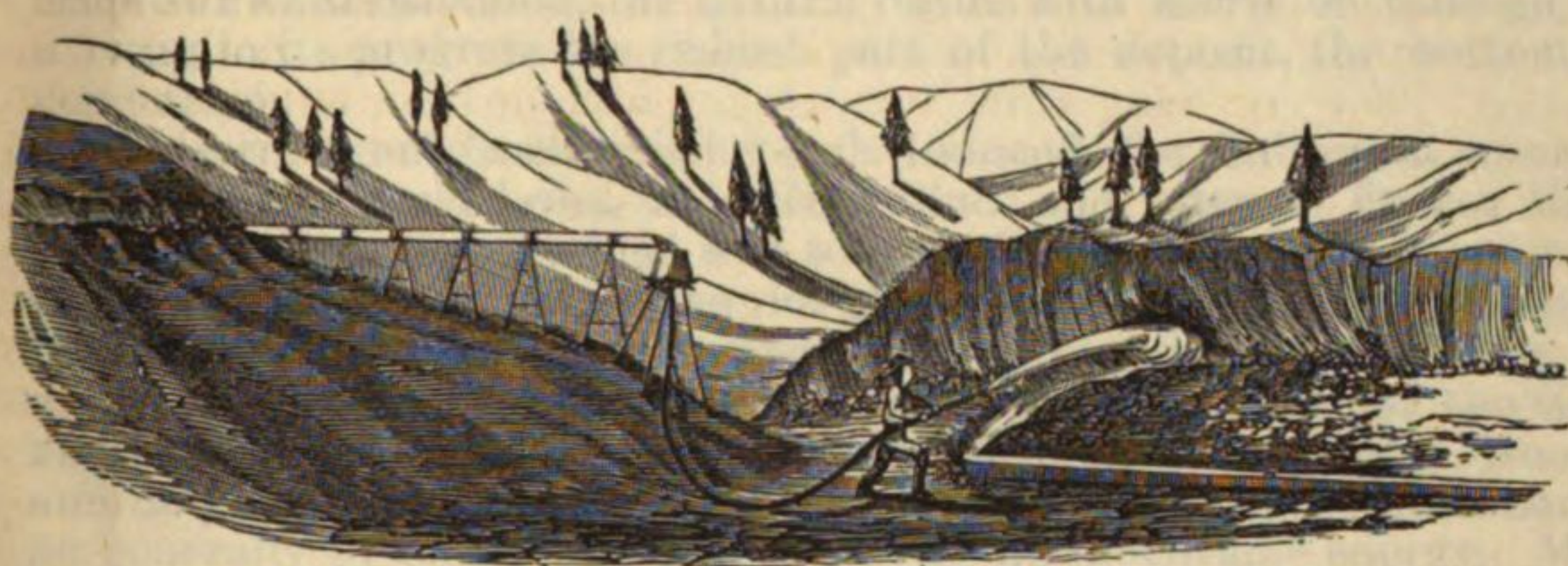


Fig. 1. Hydraulic mining in 1852. (See p. 390.)

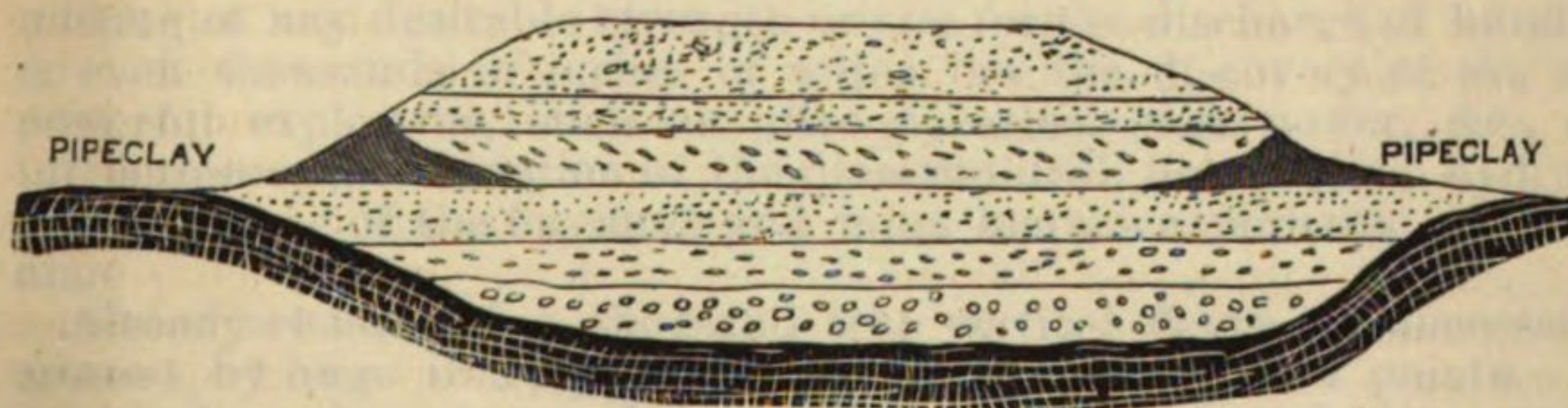


Fig. 2. Bed-rock, rim-rock, pipe-clay, and gravel (See pp. 394, 396.)

CHAPTER IV

THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth and development. It begins with the first settlers who came to the continent in search of a new home. These settlers were faced with many challenges, including a harsh climate and a lack of resources. Despite these difficulties, they persevered and built a new society. Over time, the United States grew from a small colony into a powerful nation. It fought wars, expanded its territory, and became a leader in the world. Today, the United States is a country of many cultures and people, united by a common history and a shared future.

How well this canvas hose has answered the purpose is evidenced by the fact that even now, after a trial of twenty years, it is used to a great extent, particularly in mines to which the transport of iron pipe is inconvenient. With the increasing strength of the material for hose greater pressure could be applied, and, in some favored places, hydrostatic pressure of a hundred or more feet was created, producing a working power, which overwhelmed in a short time by its own strength the facilities for its application; or, in other words, absorbed the grade or fall, indispensable to hydraulic mining, in both directions; filling, in the downward direction, the natural outlet with *débris* or tailings, and leaving in its progress the richest part of the deposit, the bottom, beyond reach.

The same venturesome spirit which induced the California miner to rush to fabled Gold Lake, or to Gold Bluff, and later to Frazer River, Idaho, Arizona, &c., had led him to seek, in the hydraulic process, the quick realization of his hopes for great wealth; but when it became evident that *besides* the rich placer, large water-ditches and long tunnels were necessary, requiring both money by the hundred thousand, and time by many years, then the zest for hydraulic mining drooped, and only a few enterprises outlived the reaction. These were carried on generally by men of small means, but of indomitable energy. Many years of anxiety and hardship passed, but the time came when ditches, from twenty-five to fifty miles in length, supplied plentiful water, and tunnels, long and deep, carried in endless flow hill and mountain side to the river-beds and valleys below. Success was gained; experience had shown that the larger the scale on which hydraulic mining was carried on, the more profitable the results would be. New inventions were made; instead of discharging streams of two or three hundred inches against the "bank," a thousand inches of water, about equal to 1,579 cubic feet per minute, were discharged with a velocity of about 140 feet per second. Bank-blasts of from five to fifty tons of powder were fired, preparing the ground for the action of water. Splendid results were realized, and hydraulic mining became a favored field for the investment of capital.

Not only such inventions as Craig's "Globe Monitor" and "Dictator," or Fisher's "Knuckle-Joint and Nozzle," all of them instruments admitting of any desirable strength or size for the discharge of hundreds or even thousands of inches of water, but the discovery of the most powerful explosives, such as nitro-glycerine, giant-power, &c., and, furthermore, the invention of the diamond drill, have raised hydraulic mining to one of the foremost and most lucrative pursuits in California.

Already chasms of a thousand feet vertical depth are successfully crossed by huge iron pipes to convey water to isolated points. The practical test has proven that air can never collect at the lowest point of the inverted siphon, the point where the greatest pressure of water results. Uncalled for as this remark may seem, it must be excused for the reason that actually men of good sense and some engineering capacity expressed fear that air would be carried down with the water to the lowest point of the pipe or siphon, and collect there finally to a great extent under the pressure of two immense columns of water, and might explode at any moment as in an over-charged air-gun. This question was decided like the dispute about "weight or no weight of the fish in water"—not by philosophy, but by practical experiment. After the great pipe of the Spring Valley Canal and Mining Company, of Cherokee, Butte County, was laid across West Branch—a depression of about

900 feet—great care was taken in filling it, and the air-valves were carefully watched. These air-valves showed action on that side only from which the pipe was filled; when the column of water rose to the point of discharge not a single air-bubble could be perceived, and the water decanted gently and without a ripple. As the danger of accumulation of air was only feared for pipes conveying water under enormous pressure, the experiment cited above must necessarily dispel all false theories, and it must be acknowledged that the only question in the conveyance of water through pipes is that of sufficient strength of the pipe to stand the pressure of the water, be the vertical height 500 or 5,000 feet.*

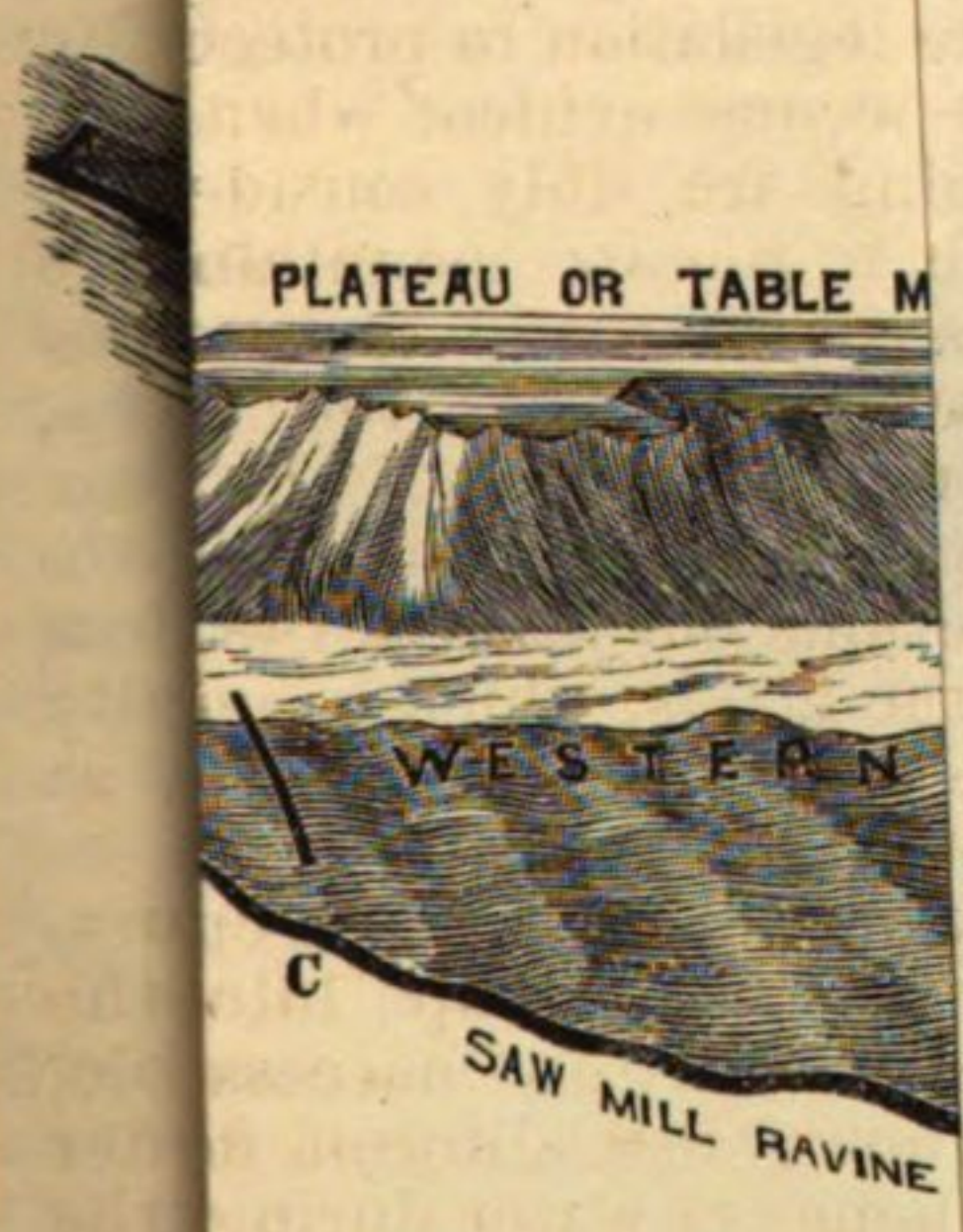
Thus the field for hydraulic operations is immensely enlarged; almost all gravel deposits are accessible, no matter at what elevation they are found, and the production of gold will keep pace with the development of other great industries of the country.

Legislation.—The Congress of the United States and the legislature of California have done much by passing wise laws for the protection and encouragement of mining interests; and it is to be hoped that further protection and facilities will be granted where justice and good sense recommend them. How necessary more legislation to protect the great hydraulic mining interest will be must become evident when the unavoidable consequences of hydraulic mining are duly considered. The whole process of hydraulic mining tends to remove mountains of auriferous gravel deposits from their natural position and to transfer their bulk to the valleys below. Where water-courses, like the Yuba, Feather River, American River, and other large tributaries of the Sacramento River are the first recipients of the debris and tailings produced by hydraulic mining, the danger of a serious blockade of the flow of tailings is, to a great extent, removed by the floods, which generally occur every winter season, and culminate, as experience has shown, at least once in ten years, in an immense rush of waters.

These floods clear the rivers to a great extent, and wash the accumulation of tailings into the Bay of San Francisco, and perhaps into the Pacific Ocean. But where such water-courses are entirely inaccessible, and where only small streamlets (generally known in California under the name of "dry creeks," carrying great volumes of water during the rainy season, but altogether dry in summer and fall) are the natural outlets, or where even these streamlets are wanting and artificial outlets have to be made, serious questions about the deposit and accumulation of tailings arise and threaten to cripple one of the most important branches of that industry, to which California owes her rapid rise and wonderful prosperity.

Since the lands of the United States were thrown into market, farming locations have been made in closest proximity to the mines; in fact alongside of those "natural outlets" which had been used for many years prior as the recipients of tailings, an unfortunate rivalry has arisen between the mining and farming interests of the State; some of the most influential newspapers of the country unqualifiedly pleaded the cause of the agriculturist, and the miner was represented as a mere defacer and destroyer of the face of nature. When it is considered how immense is the area of agricultural land, and how limited, comparatively, the extent of mineral land, it seems surprising that such antagonism should arise, or that all legitimate means are not used to remove the causes of irritation.

*The trouble arising from air, as well as the danger of a collapse by a vacuum, will be discussed later.



PLATEAU OR TABLE M

WESTERN

C

SAW MILL RAVINE

Red Hill, 830 feet. B B, tunnels o

It is evident hydraulic mining necessarily creates an immense flow of debris or tailings, and, therefore, this modus of mining requires not only the introduction of great quantities of water, through long and costly ditches, or the boring of long tunnels, equally expensive, but also facilities for the deposition of the debris or tailings in whatever natural or artificial outlet and place of deposit is offered. If, therefore, this place of deposit for the tailings is denied, hydraulic mining is at an end. On the other hand, whenever the farmer receives his patent from the United States he is sole master of his quarter-section, and can and must protest against any trespass on his property. Should his property cover the only outlet to the richest mining region in California, and even should this outlet have been used for twenty years as the recipient of tailings, the farmer's right would not yield to any priority, and the only way to dispossess him of his farm would be to buy him out at his own price.

It might not deserve the name of hardship if the miner were called upon, in a few isolated cases, to secure the legitimate pursuit of working his mines by paying enormous prices for land thus necessary to him; but when whole townships would have to be acquired in this way, and when farming locations were made more for speculative than for agricultural purposes, such proceedings would become the most offensive tyranny.

The proximity of these lands to some of the great gravel channels of the country has *enriched* them more or less with fine gold, in such a way that the question whether they are truly mineral or agricultural may arise, and at the same time *impoverished* them by thick layers of volcanic debris, sand, and other unfertile materials. Common sense declares that such lands, as a whole, are not fit for agriculture. Where exceptions occur let them have their full weight; but even then it must be borne in mind that certain portions of the lowlands flanking the great gravel-streams of California are as necessary to hydraulic mining operations as water or deep placers themselves.

The General Land Office has withdrawn some of the lands in question from market, an act of justice which deserves the highest praise; but, nevertheless, these lands may be thrown open to entry again, and then the question will arise.

The miner pleads that the lands are necessary to him as a place of deposit for his tailings; that, in fact, without them work in his mines is altogether stopped; that millions of dollars have been spent in improvements, and that these improvements will be almost a total loss in case these lands are deeded away by the United States Government; that the right of way for canals and ditches, granted by the United States Government, must necessarily include the right of *in* and *out*; that the water coming *in* is generally pure; that the water going *out* is surcharged with tailings, and must necessarily commit damage of some kind unless discharged into a stream large enough to carry all tailings along; that the Government has granted this right of way over its own land; that the outlets for tailings were used under this authority long before the United States parted with the property, and that therefore the right of way ought not to be alienated from the miner, and all damages legitimately and necessarily originating from it ought not to fall to his responsibility; and that a new disposal by the United States of the lands necessary as an outlet to the miners would be an act of injustice.

Could not these lands, worthless for agriculture but indispensable for mining, be altogether withdrawn from market, leaving them open for

all mining operations of the vicinity, so that no individual interest could enter upon them? Should a settler go upon these lands he might do so at his own peril, reaping for the time the benefit of their use, without being entitled to damages whenever the tailings overwhelmed him.

Congress might appoint a commission of competent men to investigate and report on the lands in question, and the farmer would no longer run the risk of settling in good faith on lands which would only yield trouble and lawsuits to him; nor the miner fear to see his valuable improvements made worthless, or the proceeds of his mines swallowed up by enormous payments for damages.

The question about the disposition or placing of tailings assumes such importance in view of the increasing hydraulic-mining interest, that the writer has considered it his duty to point to the future with a warning finger.

The three principal requisites of successful hydraulic mining are, first and foremost, a gold-bearing gravel deposit; second, and not less important, the facilities for outlet and deposition of tailings; third, an abundant and permanent supply of water.

THE DEEP GRAVEL-DEPOSITS OF CALIFORNIA.

These deposits occur in basins, channels, or river-beds, differing in depth, width, and length like the living streams, ponds, or lakes of the present day. The deposits themselves, consisting of gravel, drift, or shingle, sand, and clay, differ in size of boulders and compactness of the different stratifications, as well as in their composite parts. They consist of the detritus of all classes of rock known in California, and have received evidently their gold from the quartz, which appears either in boulders and pebbles, or in sand, throughout these immense deposits. The great and noted channels* containing those deposits run from north to south, and are indicated by gravel ridges and table-lands, the latter very often covered with lava, basalt, or other volcanic matter, such as ashes and scoria.

Springs inside of the rim-rock are sure indications of a deep channel or basin. The rim-rocks, or in other words the shores, or banks of the ancient stream, must once upon a time have been high enough to confine the gravel-deposit within their limits. For instance, a gravel-deposit appearing to-day in the shape of a table-mountain, must have represented, in a former age, the shape of Fig. 3, and gained its present appearance only through the agency of water, which destroyed those portions of rim-rock and gravel deposit lying outside the dotted lines marked in the figure. The cause which partly destroyed the rim-rock or shore of the channel, and left high plateaus or table-mountains as isolated landmarks of the ancient gravel-stream, has undoubtedly, to a great extent, obliterated every surface indication of the existence of such a gravel-deposit; or even destroyed the last vestige of gravel-deposit and channel, by creating gorges for modern rivers, which cross the ancient gravel streams nearly at right angles, and many hundred feet lower. As an instance, the table-mountain in Plumas County,

* Theories differ concerning the extent and direction of the gold-bearing channels or deposits. The latest, and probably the most trustworthy, will be found in Mr. Bowman's chapter on The Pliocene Rivers of California. I have not felt myself justified, however, in conforming the statements of this report to any one theory. The chapter on California, and this chapter of Mr. Waldeyer's, reflect the opinions of local observers and authorities.—R. W. R.

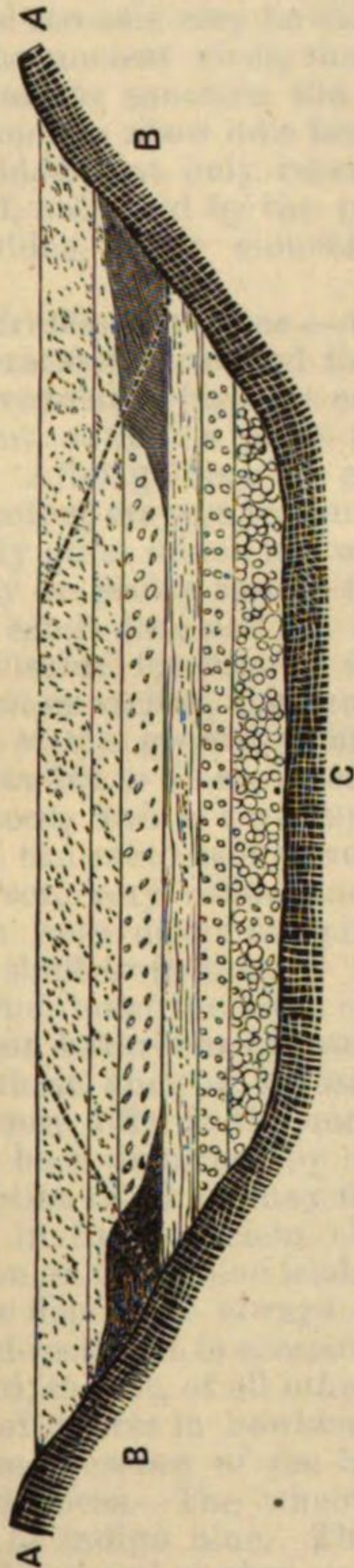


Fig. 3. A A, old rim-rock ; B B, pipe-clay ; C, bed-rock, or bottom of channel. (See p. 394.)

known as Walker's Plains, and the table-mountain near Cherokee, in Butte County, both of the same formation as to gravel-deposit, &c., may be cited. These two table-mountains were once evidently parts of the same great gravel-stream, but are at present separated by a distance of about thirty miles, and by gorges of more than a thousand feet depth, forming now the beds for the West Branch and North Fork, both tributaries of Feather River. The practical miner has known for a long time that these deep gravel-streams may be discovered by following the presumptive course of the ancient river, though all outward indications have disappeared; and, to sanction the view of the practical miner, and, at the same time, to show how beneficial is the application of science, it may be added that only recently valuable deep-gravel deposits were developed, indicated by the geological survey of Professor Whitney, though hidden under mountains of apparently valueless detrital matter.

Adaptability for hydraulic operations.—Almost all gravel-deposits are fit for hydraulic operations, provided they are gold-bearing and will admit of those improvements which are essential to this class of mining, to wit, sufficient outlet, a place of deposit for tailings, and abundance of water. After gaining the certainty that these requisites can be obtained, the miner may go to work to open his mine, confident of success. If already other mines are worked in apparently the same gravel-deposit, he may be pretty sure to find the same stratifications of gravel, cement, clay, sand, &c., and he must then judge for himself whether it will be advisable for him to drive at once a tunnel, or to ascertain first, by shaft or incline, the depth of the basin or channel.

Should the nature of the ground admit the sinking of a shaft or incline, it would be advisable to do so, since even after a tunnel is completed, water introduced, and everything ready for hydraulic operations, the opening of the mine will have to be done either by shaft or incline. It is, however, very often, and particularly in those deep gravel-deposits which were never submitted to drainage, a costly and difficult job to sink a shaft or incline, by reason of the quicksand and loose gravel. The miner must therefore consult the extent of his means before he ventures upon hazardous operations.

The character of these ancient deposits, generally speaking, is the same. Though they may differ in the hardness and compactness of the gravel, or may have been disturbed by local influences, still there is a prototype, the description of which may fairly apply to all. The oldest gravel-deposit found in these ancient channels is that drift deposit known under the name of the "blue lead."

The blue lead.—This deposit is always found deepest in the channel and nearest to the bed-rock. It is composed of boulders of serpentine rock, talcose slate, and, in fact, of all other rocks belonging to the slate family; besides this, of quartz in boulders, gravel and sand, with an admixture of clay, the presence of the latter being always considered a favorable sign for richness. The whole mass is of a color varying from blackish green to indigo blue. The quartz, though originally of pure white, is tinged blue, and neither washing nor exposure to air will discolor it.* Very often a deposit of huge boulders, rather rough and

* Mr. Waldeyer's description of the blue lead is contradicted by some other observers, who say that the blue color of the lower deposits of auriferous gravel is due to the existence of protosulphides and protoxides of iron, which change on exposure to the air, turning red. They say also that the line separating these two colors in the deposit is not one of regular stratification, but irregular, and dependent upon the access of oxidizing agencies. Also, that the boulders of the blue lead become "rotten" by exposure.—R. W. R.

angular and intermixed with only a little gravel, is found near the rim-rock—a mass resembling very much a moraine, and of no value for mining purposes. This deposit, however, will slope down toward the center or depth of the channel or basin, and the regular blue lead will appear on the top of this “moraine,” sometimes only a few inches in thickness, but gaining steadily in size in the same ratio as the “moraine” diminishes, till finally the bed-rock is reached by the blue lead, which may have gained a thickness of 40 feet or more.

This blue lead is found in deposits rising from a few inches to over a hundred feet in thickness, and is generally considered the richest and most reliable gold-bearing deposit in the country. Though tightly packed, it can be easily removed by the pick, and affords, therefore, under proper circumstances, an excellent material for hydraulic operations.

Blue cement.—There are exceptions, however, to this condition. We find this deposit sometimes changed into the hardest kind of blue cement, yielding only to the constant application of drill and powder. This cement is generally very rich, but has to be submitted to a crushing process in mills, similar to quartz-mills. In such cases the hydraulic process can therefore only be applied till this blue cement is encountered, but it produces a double benefit, extracting not only the gold from the upper strata, but also freeing the blue cement from all incumbrances, and making thus its breaking up a comparatively easy matter.

Rotten boulders.—Next to the blue lead or cement a yellowish or reddish gravel is found, generally very rich. It is known in some localities under the name of rotten boulders, and is composed of quartz, gravel, and boulders of clay-slate. This deposit is from 5 to 25 feet in thickness, in some localities even thicker. It is rather soft and easily worked, and consequently excellent material for the “hydraulic.”

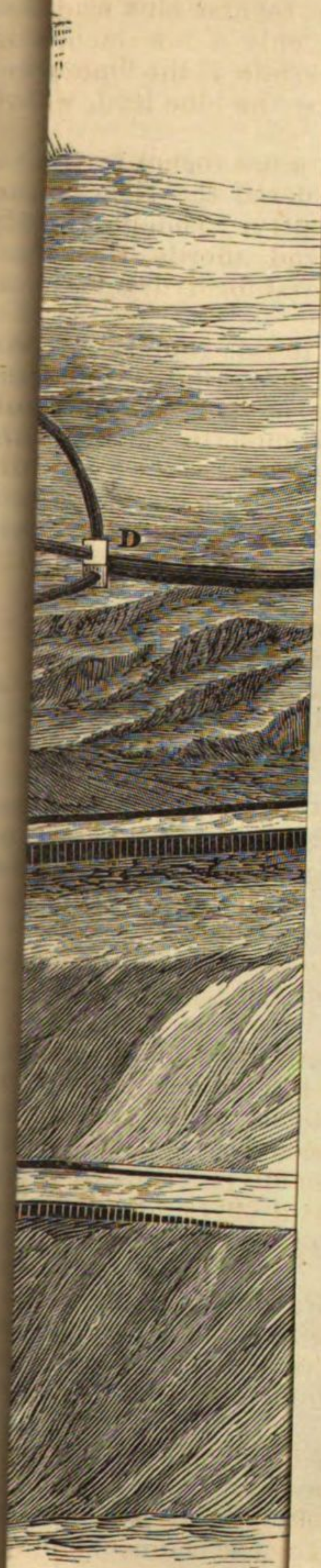
Upper gravel.—The blue lead and the yellow gravel, or rotten boulders, next to it, are the principal gold-bearing strata; still, the deposits of quartz, gravel, and sand overlying these in huge masses, contain fine particles of gold, known as flour-gold, in sufficient quantities to make the working of these upper strata sometimes very remunerative.

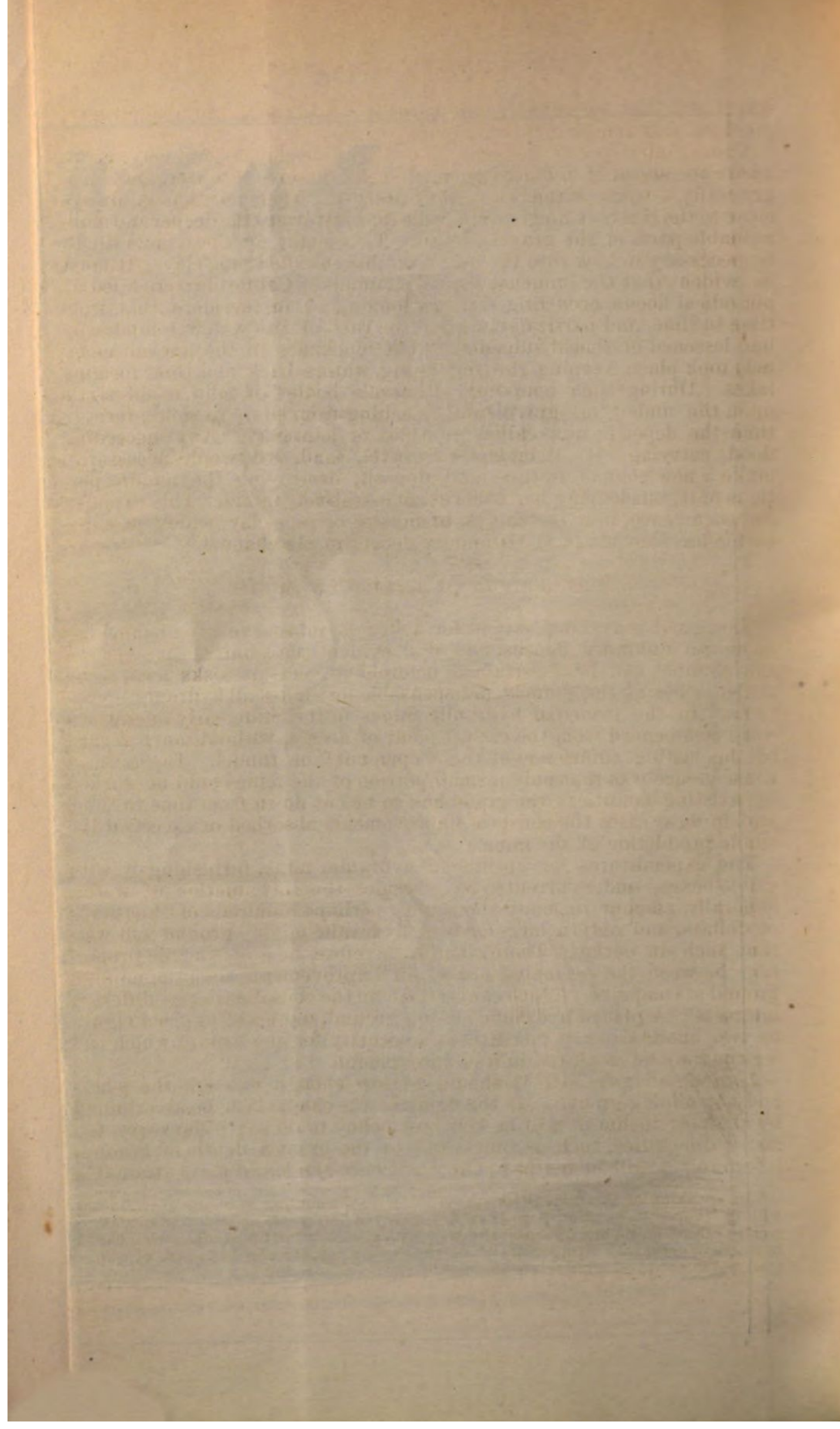
These different deposits gain their full characteristics only toward the deeper and more level portions of the channel or basin, and are less pronounced toward the sloping river or shore.

Quicksand.—As on the bars of the present rivers, great bodies of sand are found on the sloping rim-rock, which, under the influence of water, become quicksand and form the greatest obstacles to the sinking of shafts or inclines, whenever found. This sand seems to be nothing but crushed quartz, and yields in many instances small particles of gold. In hydraulic mining it is rather an advantage, as it offers no resistance to a stream of water and facilitates the caving of any superincumbent strata.

Iron cement.—Small streaks of a very hard, brownish cement, generally called iron cement, from 1 to 2 inches thick, may separate the different gravel-deposits mentioned above. These cement-streaks are easily crushed by the falling bank or a blow of the sledge, and thus disposed of.

Pipe-clay.—In almost all deep gravel-deposits a sedimentary deposit is found, which is known under the name of pipe-clay. This deposit is generally found in huge masses near the rim-rock or shore of our deep gravel-streams, and is evidently the sediment of immense bodies of muddy water. Fortunately that substance, which has really the characteristics of clay, and deserves its name, is very rare in our mines and only occurs in small layers. Even thus, it is troublesome and hard to dispose of, as





water will not dissolve it, but turns it into a pasty, tough substance, yielding only reluctantly to the pick.

These mud-deposits, however, known as pipe-clay or joint-clay, break under the shock of a blast into fine pieces, dissolve in water, and have generally a worse name than they deserve. Their position is always close to the rim-rock and their bulk disappears toward the deeper and more valuable parts of the gravel-deposit. To account for these facts it will be necessary to look into the origin of this so-called pipe-clay. It must be evident that the immense gravel channels of California were filled by periodical floods, occurring through long ages; furthermore, that from time to time, and particularly when the rush of the waters temporarily had lessened or almost subsided, great blockades in the ancient channels took place, keeping the remaining waters back and thus forming lakes. During such temporary intervals bodies of mud could settle upon the underlying gravel, and, reaching from shore to shore, form in time the deposits now called pipe-clay or joint-clay. Any succeeding flood, carrying with it masses of gravel, sand, &c., would necessarily make a new channel in this mud deposit, destroying the middle portions of it, but leaving both shores comparatively intact. This explains the occurrence, near the shores, of masses of pipe-clay, which, as experience has shown, almost disappear deeper in the channel.

THE OPENING OF HYDRAULIC MINES.

The great gravel-deposits fit for hydraulic mining rest in channels or basins of unknown depths, and it is evident that, unless the depth of the channel can be ascertained beforehand, certain risks have to be taken in boring the tunnels, indispensable for almost all hydraulic operations. In the principal hydraulic mines in the State early operations were commenced from the easiest point of access, without much regard to the lasting sufficiency of the "open cut" or tunnel. The natural consequence was that only a small portion of the mine could be worked by existing facilities; the grade had to be cut down from time to time, and in most cases the constant improvements absorbed or exceeded the whole production of the mine.

The expenditures for opening a hydraulic mine, furnishing it with sluice-boxes, under-currents, &c., besides the introduction of water, generally amount to many thousands, perhaps hundreds of thousands of dollars, and only a large area of hydraulic mining-ground will warrant such an outlay. There should, therefore, be a reasonable proportion between the estimated outlay for improvements and the mining-ground at command. Much can be done by the consolidation of different interests. A plat of hydraulic mining-ground, representing from eighty to two hundred acres, constitutes a security for any capital which can legitimately be employed in its improvement.

Location of tunnel.—This should be low enough to work the whole body of mining-ground. If the depth of the channel can be ascertained by shaft or incline it will be the best policy to do so; if, however, too many difficulties, such as quicksand, or too great a depth of ground, interfere,* it will be better to choose at once the *lowest point* attainable

* In speaking of the difficulties connected with the sinking of shafts or inclines it will be proper to mention here that it took over four years in time and \$75,000 in money to sink an incline on one of the great gravel "leads" in California, owing partly to ridges of hard rock rising in waves on the sloping rim, but chiefly to beds of quicksand and loose gravel lying on the sloping rim-rock, and bursting here and there through the "face" under immense pressure, throwing from time to time as many as a thousand car-loads into the excavated part of the incline. However, the object was accomplished, and the firm bottom strata were reached.

for a tunnel, always, however, with due regard to sufficient fall from the mouth of the tunnel for a long line of sluice-boxes, with under-currents, dumps, &c.

In choosing this starting-point for a tunnel, not only the probable depth of the channel must be taken into account, but also the fact that the necessary *grade* of the tunnel, say from $3\frac{1}{2}$ to 4 feet per hundred, will reduce its *depth*, for each additional thousand feet, 35 to 40 feet. Hence, if the extent of the claim to be worked is considerable, say 2,000 feet on the channel and 4,000 feet across it, and the tunnel, as is generally the case, runs across the channel, it will be necessary to have the tunnel in the middle of the channel, at least 40 feet lower than the bed-rock, or bottom. This is illustrated by the subjoined diagram.

It will be seen that the dotted line toward D E, on the left side, is still somewhat in the bed-rock. This is desirable, not only for the lateral extension of the mine, but also for the reason that sluice-boxes, at a reasonable depth in the bed-rock, always facilitate the work in a hydraulic mine, offering chances for grades in all directions to wash the gravel, &c.

Size of tunnel.—This must depend to some extent upon the required work, the quantities of water at command, and the length of the season annually during which the water lasts. Tunnels 5 feet wide and 6 feet high were considered in former years sufficiently large for any purpose, but since hydraulic mining has been conducted on a much larger scale the size of tunnels, in height and width, has increased accordingly. They are now generally constructed 7 feet wide and 8 feet high for single runs of flumes or sluice-boxes, and in those mines where there is a sufficient quantity of water for eight or nine months in the year, and where the remaining three or four months can be used for a thorough cleaning-up, repairing, &c.

A tunnel of such a size, with a 6-foot flume and 4-foot grade per hundred, would admit the use of 2,000 or 2,500 inches of water; the size of tunnel may be reduced if the supply of water is much less, other conditions being the same. For mines which possess a lasting supply, say 2,500 to 3,000 inches the whole year round, a much larger size would be desirable, admitting a double run of sluice-boxes, and thus an uninterrupted washing.

In former years, the idea of running a tunnel 12 feet wide and 9 feet high might have deterred the boldest; but at the present day, when the diamond drill has come into use, such undertakings can be prosecuted with a comparatively small additional expenditure and no loss in time. It has been found that it takes almost as much time to remove the fragments of stone excavated by the diamond drill as for drilling and blasting; and in consequence, the diamond drill is only employed for half the time in tunnels of limited size. But where, after the blasts are exploded, the drilling-machine can be adjusted again, without interfering with the car by which the fragments of rock are removed, a tunnel of double width can be run in the same time.

Grade of the tunnel.—This depends partly on the quantity of grade to spare. Where there is plenty of fall, a liberal grade, say 6 inches per 12 feet, or about 4 feet per hundred, ought to be given.

More grade in large flumes becomes dangerous for the pavement of the flume; a 6-inch grade will not only carry off any desirable quantity of gravel, &c., but materially assist, by the very rapid motion produced, in the breaking up of the gravel and liberation of gold. Where the fall is more limited the grade may be reduced to 5 inches in 12 feet, or $3\frac{1}{2}$ feet per hundred. Whenever less grade has to be applied, difficulties in the

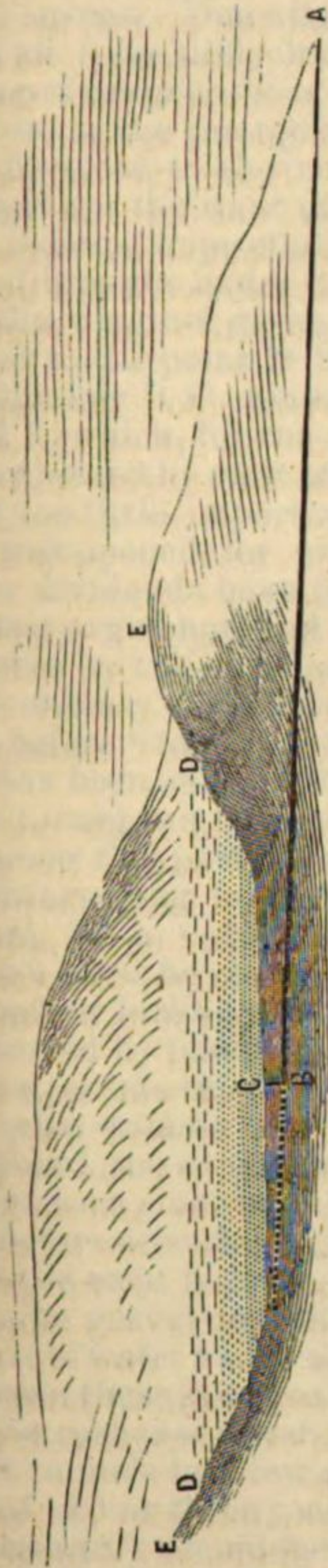


Fig. 4. A B, tunnel to middle of channel; B C, distance (40 feet) from tunnel to bottom of channel; D D, extent of workable gravel; E E, the two shores of the channel. (See p. 398.)

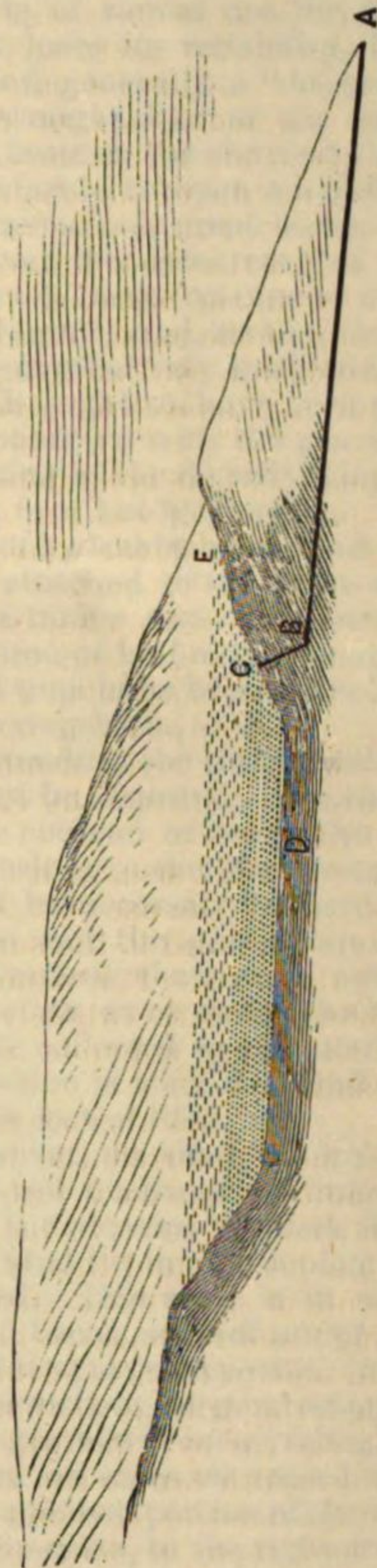
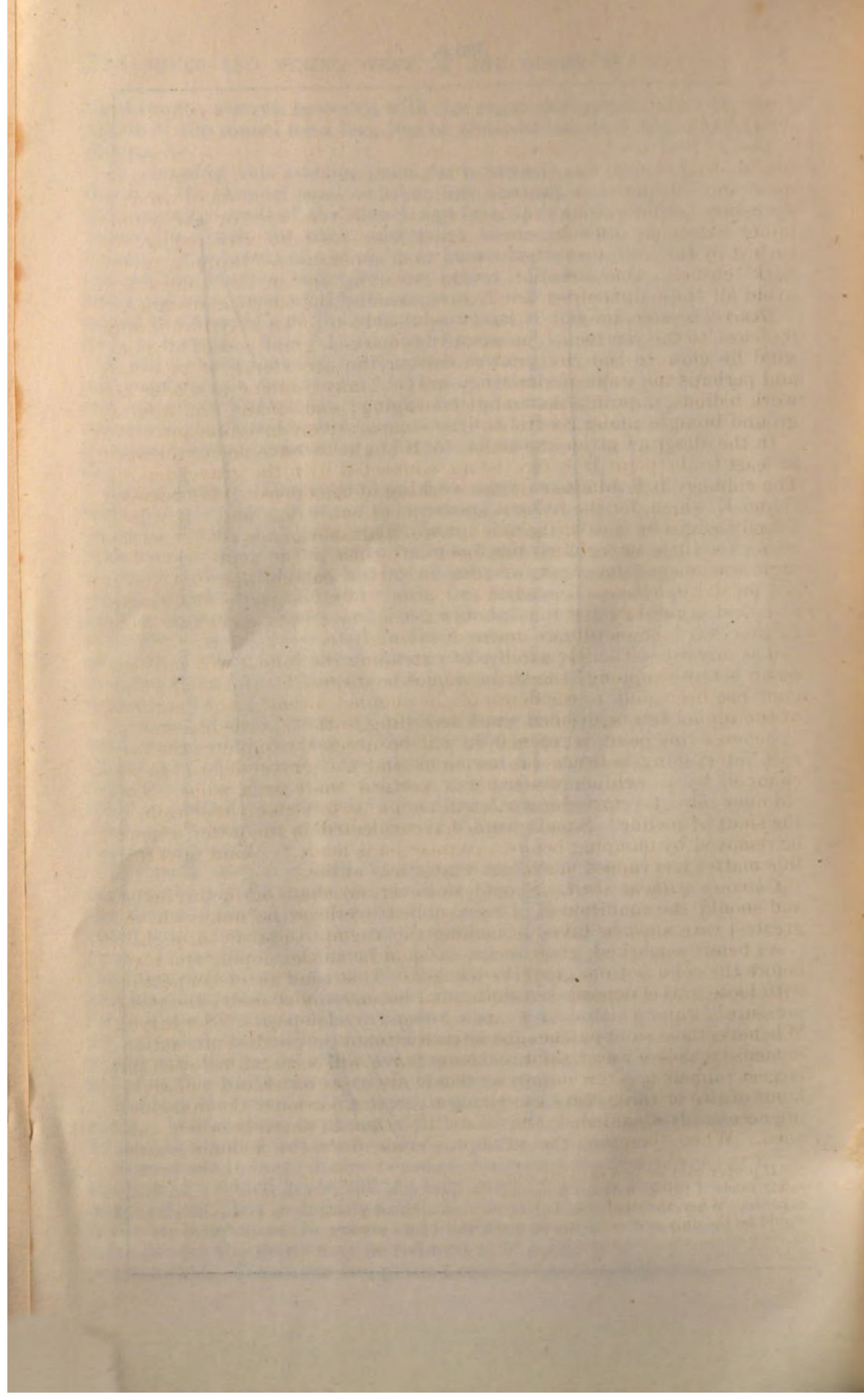


Fig. 5. A B, tunnel; B C chimney; D, bed-rock. (See p. 399.)



removal of the "pulp," and particularly of larger stones, will arise, and many hands will have to be employed to push the material along.

Line of tunnel.—This should be perfectly straight wherever practicable, in order to facilitate not only the general flow, but also the measurement and calculation of all those points, the correct location of which is necessary. Underground measurements of curves are for the simple miner extremely difficult; the magnet loses its reliability, being disturbed by the iron in the bed-rocks, and generally a "tapping in the dark" ensues. Due attention to the straight line in the tunnel will avoid all these difficulties, and insure, besides, the shortest distance.

General considerations.—It is not advisable to open a hydraulic mine too close to the rim-rock. As already remarked, great bodies of quicksand lie close to the rim-rock; moreover, the occurrence of pipe-clay, and perhaps the want of rich "pay-gravel," may combine to render the work tedious, unprofitable, and discouraging; and, finally, the mining-ground brought under control will be comparatively insignificant.

In the diagram given the tunnel A B ought to have been prolonged at least to the point D before being connected with the gravel-deposit. The chimney B C admits only the working of the deposit lying between C and E, which, for the reasons stated, is of but little value. It will be acknowledged by most of the managers of hydraulic mines, that generally either too little importance has been attached to the point where the mine was opened for work, or that an undue outside pressure and a cry for dividends have forced the adoption of half-measures against the soundest argument, and that labor and time have been wasted in many instances by the inordinate desire of saving both.

The chimney.—The advisability of extending the tunnel well into the basin before "tapping" the latter cannot be disputed. If a shaft or incline has been sunk to the depth of the channel or basin, the terminus of the tunnel can be decided upon according to the knowledge gained. Whenever this point is reached, it will be necessary to pierce the bed-rock intervening between the terminus and the gravel-deposit in the channel, by a "chimney"—either a vertical shaft or a slope. This chimney must be started in such a direction as to strike the bottom of the shaft or incline. Should water have collected in the latter it must be removed by pumping before a connection is made.* Want of care in this matter has caused much lamentable loss of life.

Chimney without shaft.—Should, however, no shaft or incline exist, and should the condition of the gravel-bed overhead be unknown, the greatest care must be taken in making the attempt to break through.

As before remarked, great bodies of sand lie in the sloping rim-rock, before the solid bottom gravel is reached. This sand is in connection with loose gravel-deposits overhead, and becomes *quick* under the great pressure of water which always exists in deep gravel-deposits. (See Fig. 6.) Whenever these sand-patches are entered without the greatest precaution, immense rushes of water, sand, and loose gravel will occur, filling often the largest tunnels in a few minutes. There are cases on record where the labor of two or three years was lost, the greatest portion of the tunnel being necessarily abandoned, and a new direction, to the right or left, pursued. When, therefore, the attempt is made to run up a chimney from

* If proper caution and skill are employed, the connection through bed-rock may be safely made, I think, without pumping out the shaft. The question is one of relative expense. When the diamond drill is employed, a long hole in advance of working would be the only necessary precaution. But in the absence of accurate surveys, and in view of the usual recklessness of miners, Mr. Waldeyer's declaration, that the shaft should be pumped out, is justifiable.—R. W. R.

the terminus of the tunnel into the unexplored channel above, the work should be commenced to the right or left of the terminus, and be continued on a convenient slope. The experienced miner will know, whenever the water increases in the seams of the rock, or when the seams turn yellow, or the rock changes to a softer stratum, that the basin or channel may be only a short distance above. When these signs occur, it is advisable to drill a hole far enough to test the thickness of the rock intervening between the chimney and the channel. Should the drill pierce the rock, it is easy to insert a thinner and longer iron rod to feel the deposit above the bed-rock. If hard gravel is struck all will be safe, and the chimney can be continued without any apprehension; but if water and sand are found, and the iron rod enters readily for 5 or 6 feet, it will be better to abandon the chimney at once, and continue the tunnel. The presence of sand and water, or quicksand, indicates that the depth of the channel is not reached, and that the most valuable gravel-deposits lie deeper, and at the same time forewarns the miner of a great danger, a rush of quicksand and loose gravel.

The diagram given herewith, representing a section of sloping rim-rock, and the different deposits as they occurred in fact, will explain itself.

The chimney, if hard gravel is reached, should be continued, as before stated, on a slope, as in this way the work can be more safely done than in a vertical shaft. This consideration may be of little importance, so long as the ground is hard and strong, but in softer strata, surcharged with water, a slope offers the only chance to proceed with safety to a certain point. When this point is reached, and a further progress barred, it is best to secure the terminus of the chimney in such a way that the water can drain off, without giving the sand, or loose gravel, a chance to run. After this a careful survey must be made to ascertain the exact spot where a shaft from the surface down will strike the terminus of the chimney. This is an easy matter when the tunnel is straight.

Shaft.—A shaft with square section, (say 4 by 4 feet,) to permit timbering, must be commenced and worked down in the usual way, as far as circumstances will permit. If the drainage established through the chimney is sufficient to free the shaft from water, it will be comparatively easy to go through sand and gravel and connect shaft and chimney; but if this drainage cannot be established, or is not adequate, even with additional hoisting of the water by windlass and buckets, it is best to procure an artesian-borer, and to make thus a connection between the bottom of the shaft and the chimney. (The character of the ground excluding the existence of large pebbles or boulders, an artesian-borer can be used to good advantage.) After this the shaft can be brought down, but must be secured firmly against side-pressure by good framing and planking.

First washing.—The connection once made between shaft and chimney, sluice-boxes may be laid through the tunnel, and the first washing of "dirt" may commence. This begins by removing the upper sections of timber out of the shaft, widening its mouth by pick, shovel, and water, and tumbling and running the "dirt" and water into it, always, however, taking care not to choke the shaft or chimney. This process is continued downward, in the shape of steps, or terraces, as security against cavings or slides. It must depend on the depth of the shaft, as well as on the greater or less safety of the ground, whether a larger or smaller opening of the shaft is to be made, since dangerous cavings may occur in spite of all precaution. In this way an opening must be made to permit the use of water under pressure. It must be left to the

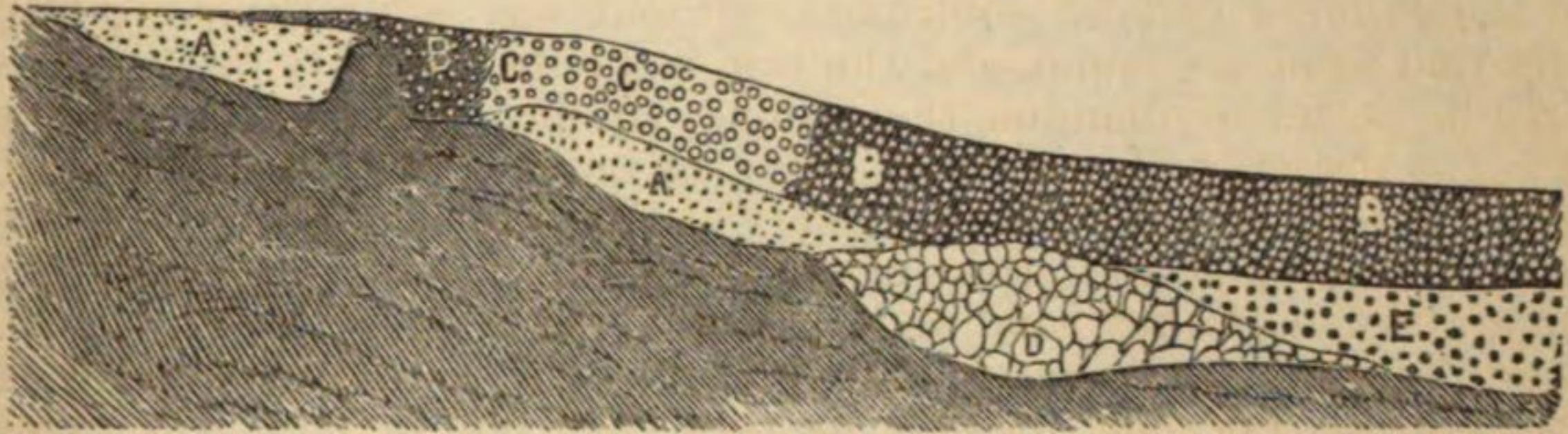


Fig. 6. A, quicksand ; B, red gravel, (firm) ; C, loose gravel ; D, moraine ; E, blue gravel ; F, bed-rock. (See p. 400.)

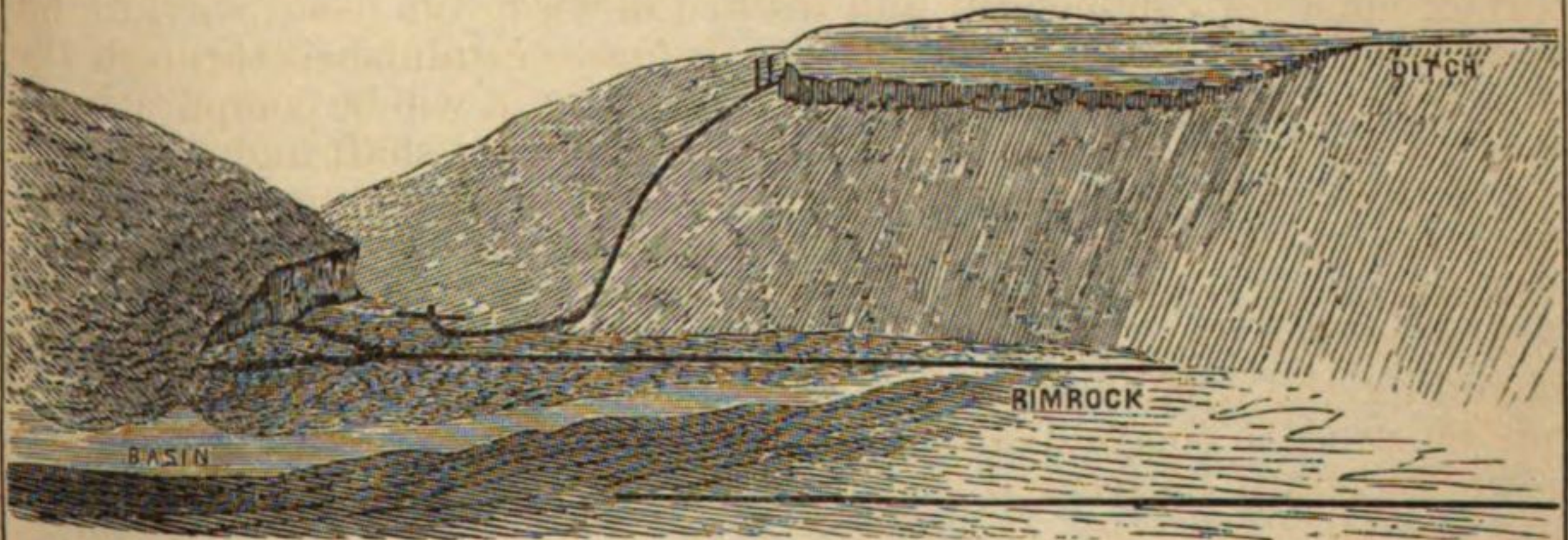


Fig. 7. Washing in benches. (See p. 401.)

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manager of the mine to shape the chimney in such a way that an easy and uninterrupted discharge in the sluice-boxes is secured.

If the main tunnel is to be continued farther it will be necessary to leave enough space between the starting-point of the chimney and the face of the tunnel to admit blasting operations. At the same time precautions ought to be taken to protect the blasters in the tunnel from any accident arising from the possible blockade of the sluice-boxes or tunnel, and the only safe expedient will be to have not only a strong barrier between the blasters and the sluice-boxes, but also to have an independent way for ingress and egress. This may be secured by widening the chimney sufficiently to admit a strong water-proof box with a ladder, by which means the miner can reach the surface of the ground, without interference from either the washings or cavings of the gravel from above, or any blockade in the tunnel below.

It will be seen that the existence of a shaft or incline, before the connection between the terminus of the tunnel and the basin or channel, is of great importance. If an incline exists, great facilities are offered to employ hydrostatic power from the lower part of the incline, as soon as a moderate opening is made to the surface.

Upper workings.—Many mines are situated so favorably that the upper strata can be worked without any expensive bed-rock tunnel. In such cases it will be advisable, if circumstances permit, to commence the working of the upper strata at once, particularly if the gravel deposit has a thickness of two or three hundred feet. In this wise a very useful and necessary work can be accomplished pending the construction of the deeper bed-rock tunnel; and perhaps a part, if not all, of the cost of the latter may be earned.

When the gravel-bank rises to a greater height than 125 or 150 feet, the work in a hydraulic mine becomes very dangerous, as the momentum of any mass of matter falling from the high bank will carry it far into the mine, endangering life and property.

To avoid these dangers working in benches is resorted to, and the washing away of the upper strata just mentioned thus serves three beneficial objects: first, in producing the pecuniary means in support of other works to be carried on; second, in lessening the depth of the shaft to connect with bed-rock tunnel; and third, in leaving a "bench," which, under all circumstances, will be necessary in a deep gravel-mine.

Connection between tunnel and surface.—The first opening of a hydraulic mine, as we have seen, is rather a tedious and expensive business; however, after a connection is once made between tunnel and surface, other necessary improvements are easily accomplished. For instance, the chimney represented as running up on a slope may be, if only short, changed into a vertical shaft, or, if long, into terraces, so that the gravel rushing down may be submitted to a crushing process, which a fall of 20 feet or more will create.

Where the bed-rock between terminus of tunnel and basin is of considerable depth a system of terraces will be more advisable than a vertical shaft, for the reason not only that the sloping chimney is far more easily changed into terraces, than into a vertical shaft, but also that the danger of blockading or choking is greatly lessened.

The terraces ought to be constructed in such a way that the first fall is the deepest, each successive one lessening as the tunnel is approached, so that the last fall is not more than a common drop of two or three feet, such as may be found on a line of sluice-boxes.

The diagram given represents a slope of 100 feet vertical height, cut into terraces.

	Feet
The first fall represents.....	30
The second.....	25
The third.....	20
The fourth.....	15
The fifth.....	7½
The sixth and last, into the boxes.....	2½
	100

Whether a vertical shaft or a slope—in other words, a single drop of 100 feet, or a succession of drops of the same aggregate depth, will be preferable, is a matter open to discussion. It seems that a succession of blows, of less force but striking the matter to be crushed from different sides, must be more effective than one very strong blow. The benefit of a drop of even a few feet on the line of sluice-boxes is well known to the miner, and a repetition of such drops must necessarily cause the repetition of the benefit, which consists in the crushing, stirring up, changing of position of the “pulp,” and the consequent liberation and precipitation of the gold.

By the time the tunnel is reached the force of the several falls or drops is broken, and a leap of 30 inches lodges the running mass in the sluice-boxes.

Connections with old workings.—The foregoing remarks about the opening of hydraulic mines refer chiefly to those mines or gravel deposits which, having never worked before, offer all the difficulties of new and undrained ground. Whenever other mines have been worked in the same deep gravel-deposit, and a neighboring claim has reached its boundaries, thus setting free one side of the gravel-bank, which shall be submitted to the hydraulic process, the tunnel can be connected with the free side by large drifts, constructed on a grade sufficient to receive sluice-boxes. These drifts must be placed deep enough in the bed-rock to permit the washing of the gravel into the sluice-boxes from all sides.

It must be borne in mind that, under the conditions mentioned, the very gravel-bank through which these drifts or cuts run will have to be washed away, and the closing up by cavings of the mouth of one or the other drift can hardly be avoided.

In the diagram given an open gravel-bank is represented, from which three drifts (Nos. 1, 2, 3) run toward the point *o*, where they are connected with the mouth of the chimney (here changed into terraces) which leads into the deep bed-rock tunnel, A B. The washing in this hydraulic mine would have to be commenced from the open bank toward point *o*, and the gravel would have to run through either of the three drifts, 1, 2, 3.

It will be easily seen that the closing up of one or the other of these drifts can hardly be avoided, and it is therefore necessary to keep always at least one open, to permit the clearing and opening of the mouth of any closed-up drift.

For instance, drifts 1 and 2 are closed; it will be necessary to wash the matter which closes the mouth of drift 2 into drift 3, and, after this is accomplished, to wash the matter which closes drift 1 into drift 2, and *vice versa*.

The force of the water will easily accomplish this, provided the drifts are deep enough in the bed-rock to keep all the caving matter on a comparatively higher plane.

The best way to clear a mass of caved matter from the mouth of a

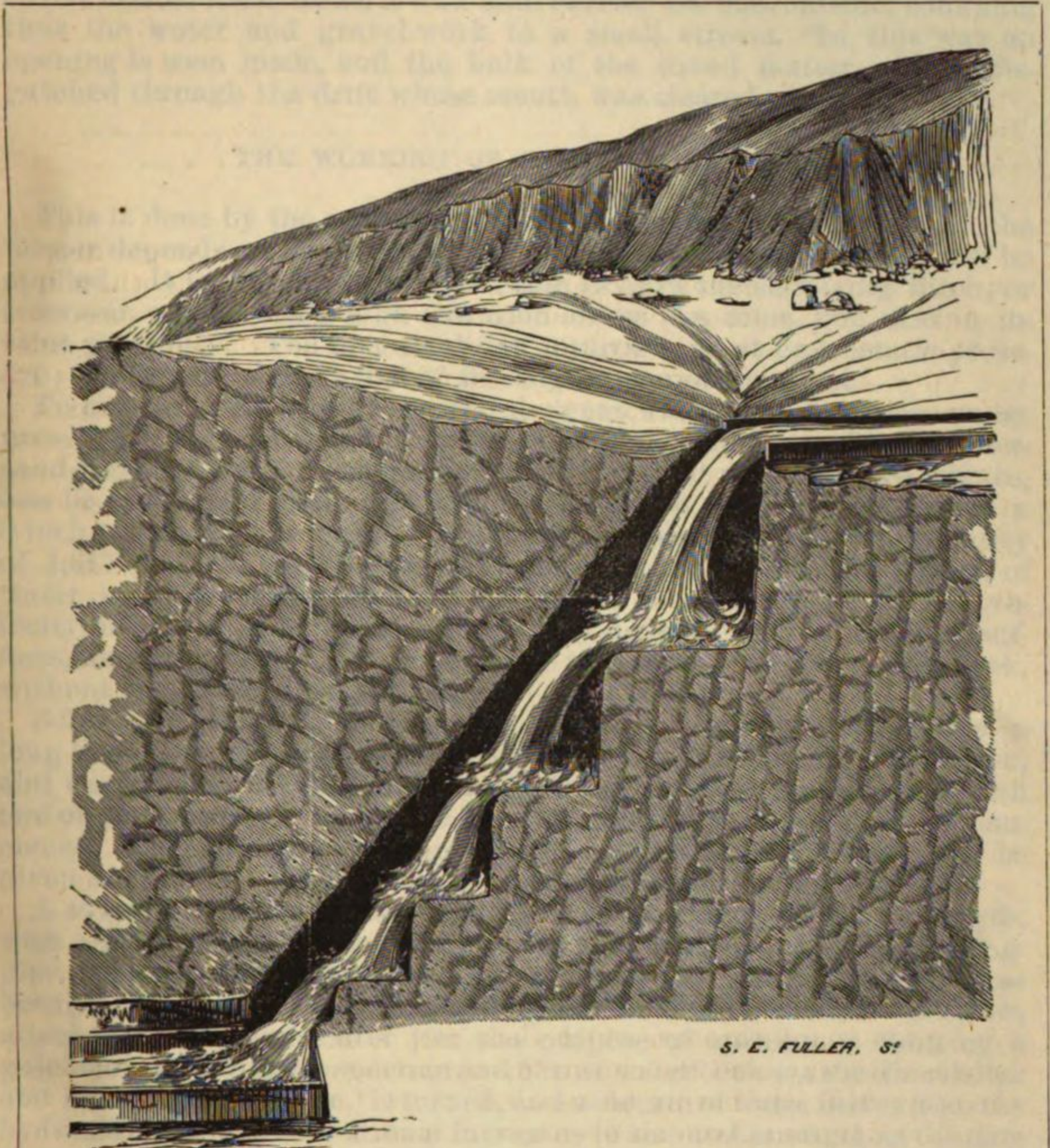


Fig. 8. Slope cut into terraces. (See pp. 401, 402.)

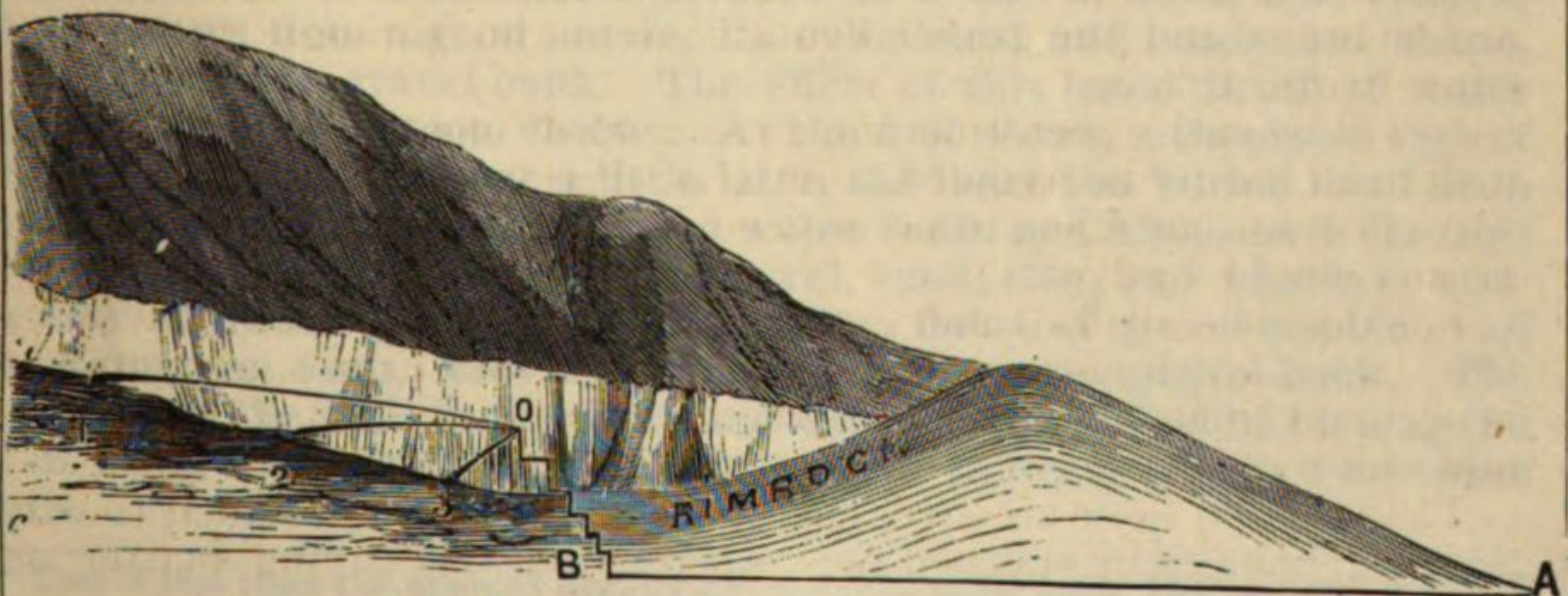


Fig. 9. Gravel-bank, with three drifts; A B, bed-rock tunnel (See p. 402.)

drift is to wash a small channel close to the gravel-bank, so that the caved matter itself forms a wall and barrier on the outside, confining thus the water and gravel-work to a small stream. In this way an opening is soon made, and the bulk of the caved matter can be dispatched through the drift whose mouth was cleared.

THE WORKING OF HYDRAULIC MINES.

This is done by the power of water and powder. The power of the former depends on its quantity, and the pressure under which it can be applied. It is therefore most desirable to have the supplying ditch, or reservoir, not only at a high elevation above the mine, but also in its close proximity. The first condition insures a great hydrostatic pressure; the second a short line of feeding or conveying pipes.

To give an idea what a powerful agent water can be made under pressure, it may be stated that a quantity of water, equal to a thousand inches, miners' measure, and yielding 1,579* cubic feet per minute, can be discharged under a pressure of from 275 to 300 feet, through a 6-inch nozzle, with a velocity of 140 feet per second, and in a quantity of 1,645 pounds, for the same length of time. Such a quantity of water uninterruptedly striking the bank, with one-tenth of the velocity of a cannon-ball, must necessarily do great execution, and suffices, in many instances, to produce the caving of the gravel-bank, without resorting to bank-blasting.

After a hydraulic mine has been opened for washing operations, a long line of sluice-boxes, with under-currents, grizzlies, &c., laid down, and water under a high pressure connected through an iron pipe with one of the improved hydraulic nozzles, the real mining work can commence. The description of the different mechanical appliances will be given further on. At present the operation itself will be described.

A single hydraulic nozzle, connected by an iron pipe of any length, with a distributor—which latter is again connected with the feeding-pipe, receiving the water from the bulk-head of a ditch or reservoir—has been placed at a safe distance from the gravel-bank to be washed. A screw, attached to the distributor (for the purpose of opening or shutting a gate commanding the connection and flow of water between the distributor and the hydraulic nozzle,) is turned, and a stream of water issues from the hydraulic nozzle. This stream increases in size and strength as the gate opens more and more, and after a few minutes a body from 5 to 7 inches in diameter, and representing from 500 to 1,000 inches, plays with magnificent force against the opposite bank of gravel. The water issuing from the nozzle is to the touch as hard as a bar of steel, and retains, when thrown from a good nozzle, its cylindrical and condensed shape, till it strikes the gravel-bank. The effect of this lance-thrust of water against the bank is soon visible. At the first shock, a thousand rays of water fly in all directions; a little later, the lance has buried itself deep in the bosom of the bank, and the water boils and hisses over the lips of the aperture, carrying with it gravel, sand, clay, and whatever matter may be at hand. The opening widens; flakes of gravel tumble in all directions; an arch, wide and deep, is made in the gravel-bank. The "jambs" of the arch to the right and left are demolished by turning the jet of water upon them, and the first "cave" in the hydraulic mine takes place.

* This is less than the amount usually given in calculations of the miners' inch. I presume Mr. Waldeyer has applied the "coefficient of contraction," which is, for a stream flowing through a horizontal slit, about .625.—R. W. R.

The caved material is washed into the sluice-boxes, good care being taken that an even flow is maintained and that the boxes are not overcharged. Pieces of hard gravel, clay, &c., too large to be washed through the sluice-boxes, must be reduced to smaller fragments by either the pick or the blast. For all such material as can be perforated by the churn-drill or auger, the process of blasting with giant powder No. 1 is considered the cheapest and most effective. Rocks and boulders, too large to be sent down by the sluice-boxes, must be first broken up. It is to be presumed that as yet room is wanting to stack them in piles on the ground.

When sufficient clearance has been made to leave ample space for the deposition of heavy boulders, tree-stumps, and other rubbish, either a derrick, or wheelbarrow, or cars can be employed to remove such objects to the place of deposit. Even with abundance of room it will be advisable to go systematically to work and keep certain order in the arrangement. This plan will accustom the workingmen to dispose at once of any incumbrances *for good and at the right place*, and will save a great deal of work in the long run.

In working a hydraulic mine it must be the aim to secure as soon as possible a large open front, so as to occupy two, three, or more hydraulic nozzles, according to the supply of water and general capacity of the works.

These different hydraulic nozzles, being supplied from the same distributor, can open a "cross-fire" upon any point within 200 feet from the nozzles and thus do excellent execution.

Fig. 10 represents the gravel-stream as falling into a chimney through the intervening bed-rock, and so into the tunnel below. It will be seen that cuts may be opened into the chimney from all sides, and can be deepened as the gravel-bank recedes and the first grade is absorbed by distance.

Should the surface of the gravel-deposit be covered by a growth of brush-wood or trees it will be necessary to remove this material by cutting it down and hauling it off the ground, or piling it up and setting fire to it.

Bank-blasting.—This is resorted to either when the gravel-deposit is so hard that it will not readily yield to the jet, or when the gravel-bank is so high that the hydraulic nozzle cannot with safety (on account of caving) be brought close enough to the bank to do good execution. The blasts may either be placed in drifts with one or more cross-drifts, (T,) or in shafts with a cross-drift in the bottom, (L,) or in shafts with a wider bottom (in the shape of a bottle, the shaft forming the neck of the bottle.) The latter are generally used to blow up patches of bottom-gravel. The quantity of powder used depends necessarily on the quality and extent of the ground to be blown up, and varies from a few kegs up to two thousand. Even larger blasts have been and will be made, as occasion requires. A keg of powder contains 25 pounds.

When a bank is from 80 to 100 feet high the main drift should be 100 feet long, so that a reasonable proportion may exist between the resistance offered by the top pressure and the lateral or front pressure. Thus a general upheaval results, and neither a blowing out of the front nor a partial blowing up of the top. The main drift should be 3 feet wide and 4 feet high, or as small as it can be worked. The side-drifts or "Ts" can be made a little larger. To secure a good effect, it is necessary to use about 600 kegs of powder for the blast, placing the contents of 400 kegs on the cross-drifts at the terminus of the main drift, each arm being from 45 to 50 feet long, and the contents of 200 kegs in the cross-drifts,

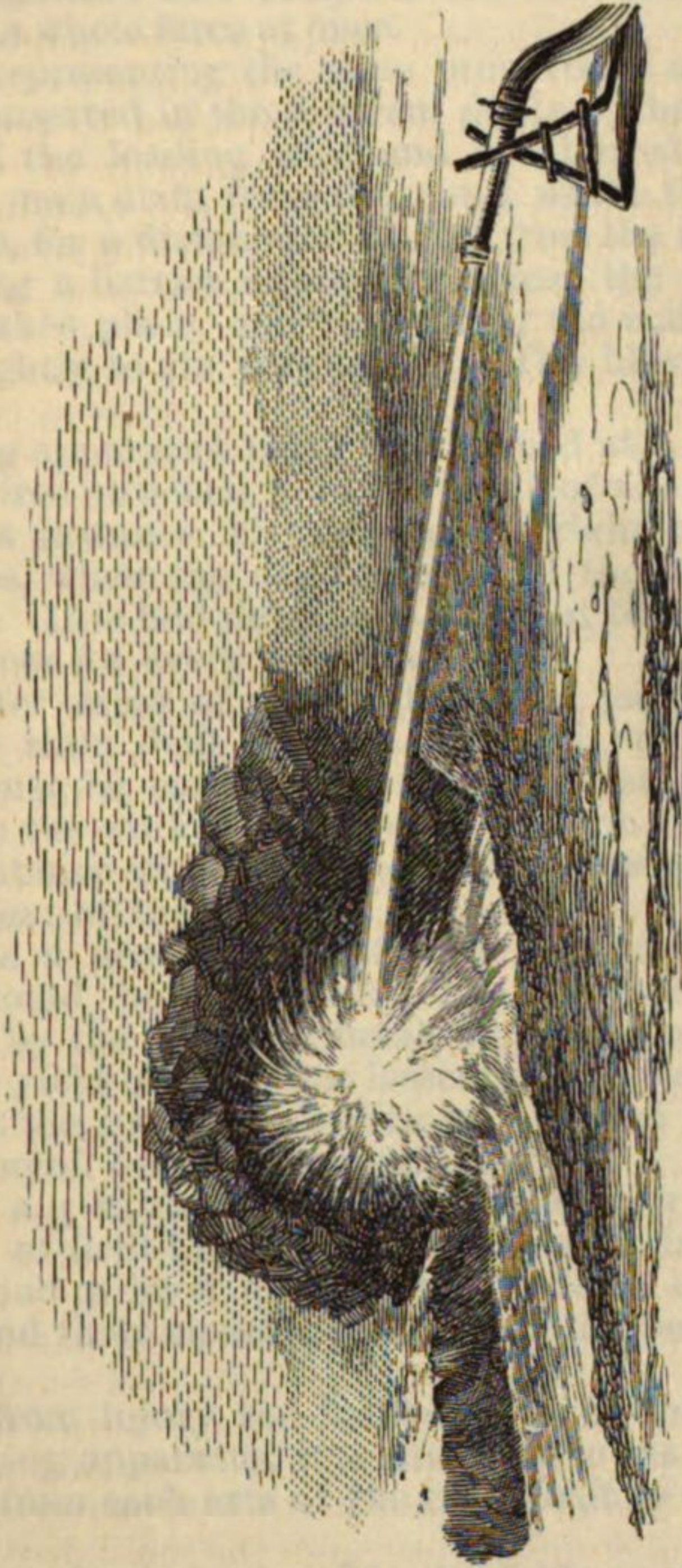


Fig. 10. The first cave; the stream, carrying the gravel, flows away on the left, and falls into a chimney, connecting with the tunnel. (See pp. 403, 404.)

located about 65 feet from the mouth of the main drift, each arm being 30 feet long. We shall thus have the accompanying figure.

This blast fired by an electrical apparatus and ignited simultaneously at twelve or sixteen different points, will in all probability dislodge and crumble an area of ground equal to that inclosed by the dotted line, representing from fifty to sixty thousand cubic yards.

The powder should be emptied in long boxes placed in the different side-drifts, and electric fuses should be inserted, at proper distances, at least one for every forty or fifty kegs of powder, which would insure the simultaneous ignition and complete combustion of the gunpowder and develop thus its whole force at once.

In Fig. 12, representing the same proportions as Fig. 11, twelve electric fuses are inserted in the different drifts. These fuses are marked in the circuit of the leading wire and are buried equidistantly in the powder. The main drift, from the point where the first cross-drifts intersect, that is, for a distance of 65 feet from the mouth, is safely closed by first making a barrier of timbers across the main drift, where the intersection takes place, and then filling the main drift with sand and fine gravel tightly to its very mouth. The blast is now ready for explosion.

The blasting-apparatus being established at a safe distance, and the two leading wires attached to it, the crank of the frictional apparatus is turned in this instance 22 times to the right, and then reversed for about 6 inches, when the discharge of all the fuses takes place at the same moment. It is laid down as a rule that ten turns are taken for the first fuse and one for every additional one.

When greater areas of ground than that mentioned above are to be blown up the main drift must be extended, and additional and longer cross-drifts must be made. The powder must always be distributed with regard to the work it will have to perform; a little experience and better acquaintance with the deposit to be blasted will soon lead to the proper treatment of the ground.

However, as a general rule, it may be said that a strong charge of powder should be employed. The extra expense for powder is easily repaid by the thorough breaking up of the ground, securing not only a greater yield of gold, but lessening also the manual labor to such an extent that the cost of an additional hundred kegs of powder, or any proportion thereof, becomes insignificant.

Shafts with a └ in the bottom are excellent for high banks, and have all the effect of drift-blasts. Besides this, it is much easier to fill or tamp them than a level drift, as the material extracted from them is deposited round their mouths, and can readily be thrown back as tamping.

To secure from injury the insulated wire, which is to be connected with the blasting apparatus, it is advisable to cut a little groove for each wire, leading from each arm of the cross-drift to the mouth of the shaft or main drift.

In case water should be found in the drifts or shafts it is necessary to use for the powder boxes made water-tight with the help of tar. The lids are perforated with gimlet-holes for the admission of the fuse. After the fuse is inserted the lids are placed firmly on the boxes, either with screws or wooden wedges, and the gimlet-holes are closed either with wax, soap, putty, or even clay, leaving everything well protected.

To blow up patches of bottom gravel 10 to 20 feet deep, bottled-shaped shafts are used. These are sunk from 4 to 5 feet in diameter to the ne-

cessary depth, say 18 feet, and their bottom is widened all round from 2 to 3 feet beyond the original periphery of the shaft.

The powder is placed in the lower excavation all round. In the center a layer of heavy rocks is placed, to be the basis for the filling or tamping material, and to prevent the latter from entering the excavated part. The shaft is tamped and the explosion takes place with generally an excellent result. The ground will be crushed from 15 to 20 feet in every direction from the shaft and will yield readily to the hydraulic jet.

Giant-powder blasts have been tried in several hydraulic mines with great success, according to the published reports. Giant-powder No. 2 is used for this purpose.

In drifts, as represented in Fig. 11, very likely 2,500 pounds of giant-powder would have to be used, placing the same in lots of 500 pounds each at different points. For instance, 500 pounds would be placed at the end of each of the arms of the upper T and 500 pounds where the main drift intersects; furthermore, 500 pounds in each of the arms of the first T (65 feet from mouth of main-drift.) Every lot of the giant-powder must be tamped in very tightly, so that no space for air remains.

The discharge is made by the electrical apparatus, as already described.

In all blasting operations, from the simple hand-drill blast, removing only a few hundred pounds of rock, to the bank-blast, removing thousands of tons, a careful calculation of the strong and weak points in the material attacked should precede the placing of the blasts.

WATER-DITCHES.

The ditches of California are the great arteries which bring life to the mines. Their even and constant flow secures a healthy and vigorous state of industry, while the dearth of water in the mines throws a pall over the business world of California, money becomes tight, and hard times are the consequence.

The engineering skill displayed in the construction of ditches in this State is of the highest character, accomplishing the most daring feats, hanging flumes on steep, rocky bluffs, and crossing gorges of a thousand feet in depth; and it must seem almost a presumption to inquire whether any improvements can be suggested.

Leaving the answer to this question open for the time, we will try to state the rules and conditions which justly have governed the constructions of ditches.

Location.—The first among them must be the ample supply of water during all seasons of the year. When this steady flow can be secured, even at a greater outlay of money, let it be done by all means. The winter supply of water is well enough, but the summer supply is far preferable, as the working of a hydraulic mine then has the advantage of long days, mild weather, and water made almost tepid under the rays of a hot sun. The latter point is the most important, as the quicksilver catches the gold far more easily at a high temperature than in cold weather. The yield of gold, therefore, increases always in the summer season, other conditions being equal.

The second condition must be the high elevation of the ditch. A ditch of high elevation commands a greater field of usefulness, as it may supply mines for which it was not constructed, when the original mines are exhausted. Besides this, the increased hydrostatic pressure is always valuable.

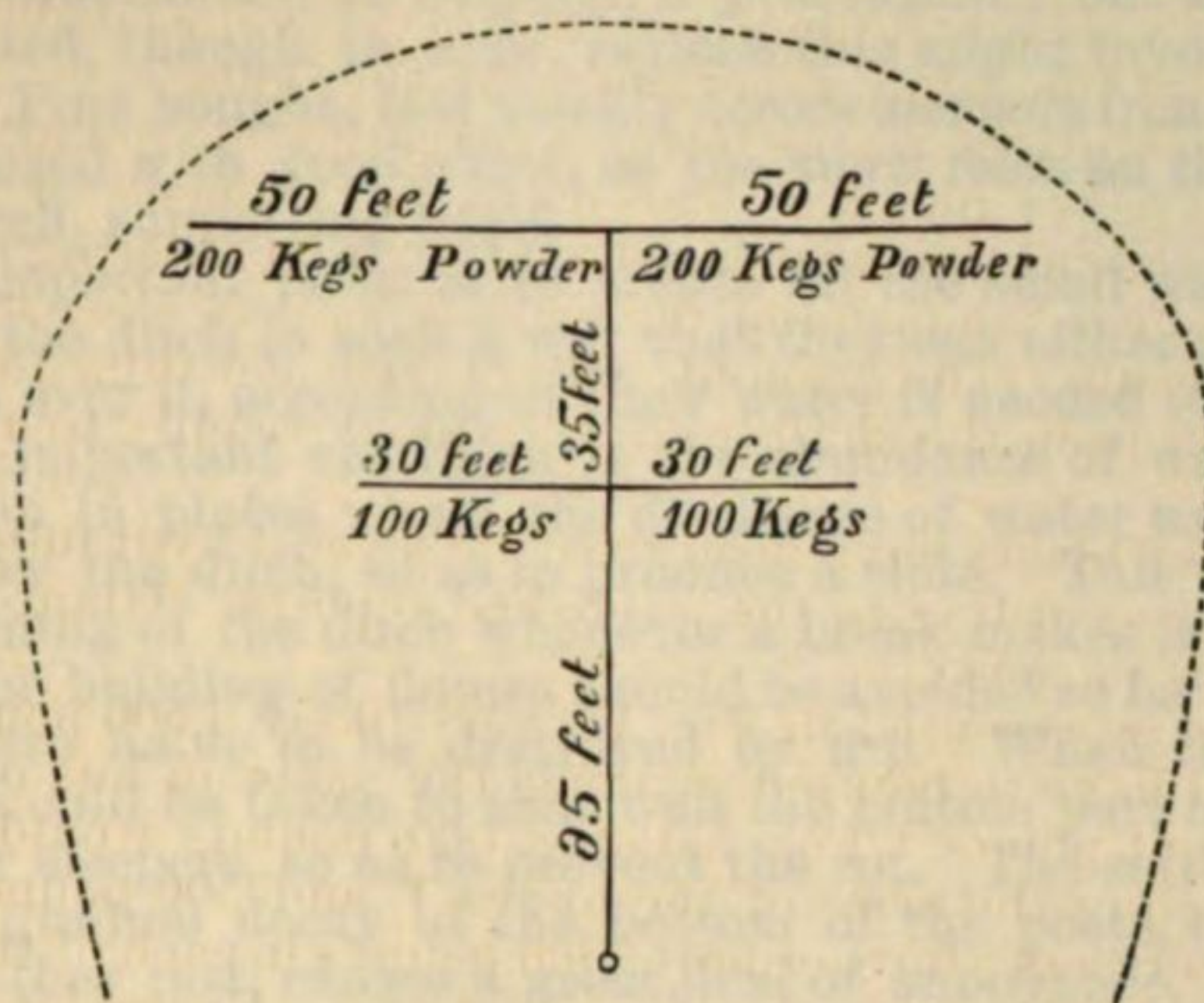


Fig. 11. Ground-plan of heavy blast. (See pp. 404, 405, 406.)

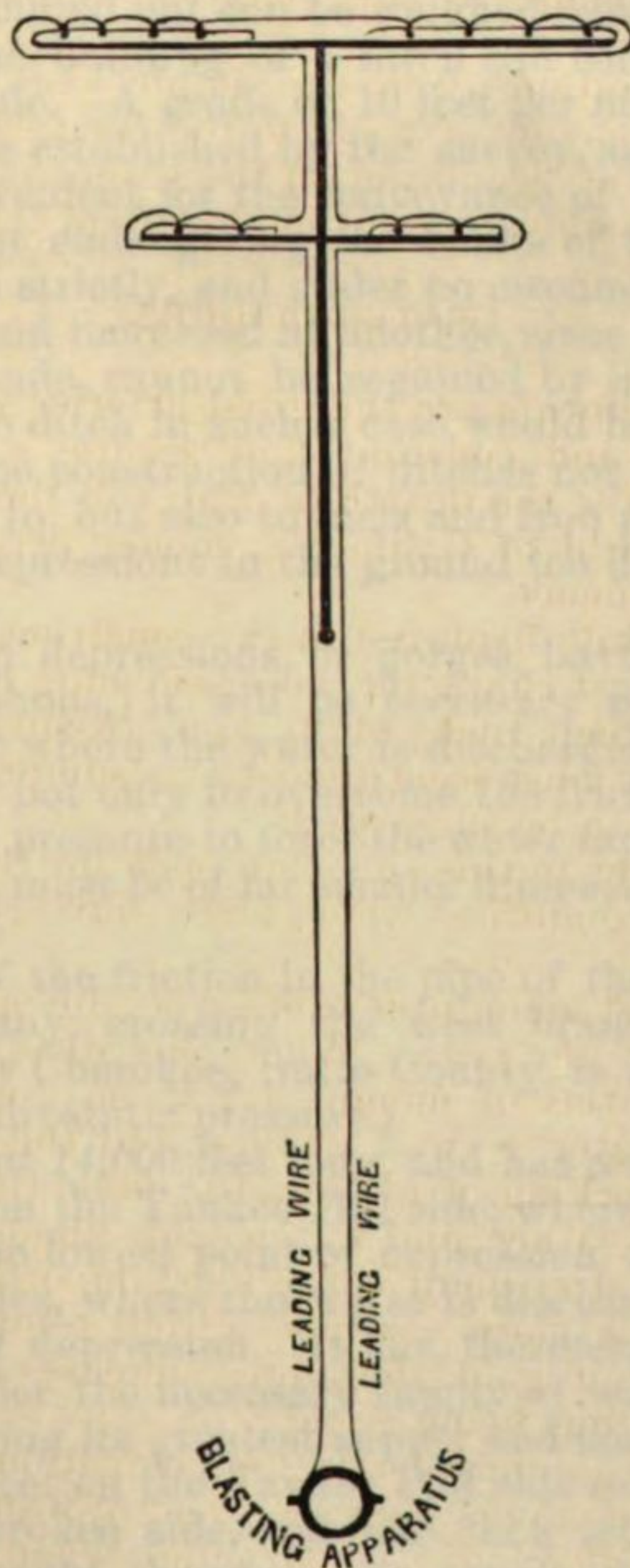


Fig. 12. Manner of firing heavy blast. (See pp. 404, 405, 406.)

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The snow-line should be avoided, if practicable; but snow-sheds can be constructed, though in some regions this might involve a great expenditure. Pine boughs, laid thickly across sleepers from bank to bank, have been used with good effect, as the snow rests on them and forms finally an arch, supporting itself.

A third important point is to secure all the small water-courses on the line of the ditch in such a way that they can either empty into the ditch or run over it, according as their water is needed or not.

A fourth important condition is the abundance of waste-gates, and their location in places where the discharge of water cannot wash the ground below the ditch, so as to produce a slide. This will permit the prompt draining of the ditch whenever a break makes it necessary.

Fifthly, the building of flumes should be avoided so far as practicable, since they are liable to be destroyed by fire. When they have to be built, care should be taken to char well the bottom part of the supporting posts or sleepers, so as to prevent the rot. The settling of flumes, due to the gradual decay of the bottom of the posts, or the sleepers upon which they rest, causes a great deal of annoyance.

Experience has shown in many cases that the above-mentioned rules deserve close attention in choosing a route for a ditch, as the advantages or disadvantages pointed out can be weighed carefully beforehand.

Construction.—The building of a ditch can commence after a careful survey has been made. A grade of 10 feet per mile (three-eighths inch per rod) ought to be established by the survey, as this grade has proven itself the most convenient for the conveyance of water, securing an excellent flow, without endangering the banks of the ditch. This grade must be adhered to strictly, and under no circumstances must it be lessened at one point and increased at another, since the flow of water, once checked by less grade, cannot be regained by increasing the grade at another point. The ditch in such a case would have to be widened.

Iron pipes.—In the construction of ditches not only open ditches and flumes are resorted to, but also tunnels and iron pipes, the latter to convey water across depressions in the ground too deep to permit the construction of flumes.

If, therefore, deep depressions, or gorges, have to be crossed by iron pipes, (inverted siphons,) it will be necessary to have the ditch high enough at the point where the water is discharged into the pipe to allow a sufficient "head," not only to overcome the friction, but also to secure enough hydrostatic pressure to force the water rapidly through the pipe, which, of necessity, must be of far smaller dimensions than the discharging ditch.

The resistance of the friction in the pipe of the Spring Valley Canal and Mining Company, crossing the west branch of North Fork of Feather River, near Cherokee, Butte County, is considered equal to 20 feet of "head," (hydrostatic pressure.)

This pipe is about 14,000 feet long, and has a diameter of 30 inches. Its vertical height on the Yankee Hill side, where the water is received, is 980 feet above the lowest point of depression, and its vertical height on the Cherokee sides, where the water is discharged, is 830 feet above the lowest point of depression. It has, therefore, a "head," or hydrostatic pressure, under the necessary supply of water, of 150 feet. The water, however, during its greatest supply and heaviest discharge, never rose more than 50 feet on the Yankee Hill side over the point of its discharge on the Cherokee side, and was then estimated equal to 1,500 miner's inches. Should, therefore, the supply of water be sufficient to fill the remaining 100 feet of pipe on the Yankee Hill side the discharge

of water would be enormous, and almost equal a hydraulic jet discharged under 130-feet pressure through a hydraulic nozzle of 30 inches diameter. It will be well to keep this fact in mind, as it may prove that pipes of far less dimensions than the above-mentioned pipe may be sufficient to discharge, under the proper pressure, any necessary amount of water.

Dam.—The place to tap the supplying stream and to build the “head dam” deserves careful consideration. The streams of California are subject to rapid rise, and change their volumes of water constantly, so that at one time all the water in the stream may be needed to supply a ditch, where at another time fifty or a hundred ditches could be made to overflow. Under these circumstances strong dams are needed. The best place to build such a dam will be a narrow place on the river, protected on both sides by projecting ledges of rock. All the mountain streams of California afford many such places. The building of the dam will be done, of course, when the water is at its lowest. The strongest dams are constructed by throwing the trunks of pine trees from shore to shore across the river, putting the first layer, or foundation, from 6 to 8 feet apart, for a width of 40 or 50 feet, then placing another layer of pine trees at right angles and at the same distance across the first layer, and alternating in this way till the dam has reached the proper height. Where the trees cross each other notches ought to be cut and iron spikes driven in, to make the structure perfectly solid. The trees which are to lie lengthwise in the stream ought to be thrown in with part of their top branches on, and turned up stream. The sand, &c., carried down by any future flood will cover these branches, and make the destruction of the dam impossible. After the structure is built, the open places ought to be filled up with stones, earth, gravel, sand, pine branches, &c., and in a short time the dam will be tight and safe against all chances.

On one or the other side of the dam a gate for the ditch must be constructed. This gate should be, if possible, in the solid bed-rock, so as not to be affected by any succeeding flood. If a ledge of rock abuts enough to admit of the construction of a short tunnel, as the connection between the head dam and the ditch, such a chance ought not to be neglected. An iron or strong wooden gate, being controlled by lever or screw, to open or close the mouth of the tunnel, for the admission or cutting off of the water, would defy any flood.

The following diagram represents the river in a low state of water, the ditch receiving the whole supply. During a flood the water would fall over the dam, and the gate being partially closed would admit only enough to fill the ditch.

Lumber.—After a careful survey is made, the best route for the ditch established, and the place for the head dam chosen, the work of digging the ditch may commence on the whole line. Should much fluming be necessary, and a great quantity of lumber have to be used for such purpose, the easy and cheap supply of the lumber deserves great consideration.

The mountain-slopes which flank the streams of California afford an inexhaustible supply of pine timber, particularly in those places which, remote from any market, have escaped the ax of the lumberman. The head of a ditch being almost always located in such a remote region, is, therefore, usually surrounded by a forest of the finest timber.

A portable saw-mill could be established at any convenient point and would furnish all the necessary lumber. The ditch, though commenced along the whole line, must be rapidly finished from the head-dam down-

ward, so that it can serve for the conveyance of sawed lumber where such is needed for fluming, &c. This mode of transport reduces the price of lumber by more than 50 per cent., since the freight amounts generally to more than that proportion of the price.

Excavation.—In digging the ditch along the mountain-slopes the safety of the ground as to slides must be well examined, and the real body of the ditch must be always dug in solid soil, and far enough in the side of the mountain to leave at the outside or lower bank a level surface on which to place a part of the soil of the bank and the ditch.

The bank on the mountain-side must be carried on a good slope at once, so as to prevent slides from it, which, during the rainy season, would otherwise occur, not only filling the ditch, but causing great and dangerous breaks, since the water, checked in its course, would run over the lower bank, causing damages which would take much time and money to mend.

No operation connected with hydraulic mining needs greater care and foresight than the building of a ditch. The best constructed ditch will cause a great deal of trouble for the first year or two, but an indifferently constructed ditch will cause not only as much repairing as the first costs amount to, but be forever after only a second-hand affair.

Deep ditches are preferable to shallow ones, as the evaporation during the summer heat is far less in the former than in the latter. Still, before deciding on the depth of a ditch—whether 2 feet or 3 feet deep—it will be well to examine the soil through which it has to be dug. If the country bed-rock is covered only with a little soil, and if a ditch 2 feet deep would avoid the bed-rock, economy dictates the 2-foot ditch made wider.

All ravines or small water-courses crossed by the line of ditch must be secured in such a way that their water can either be admitted into the ditch or carried over it, as it is wanted or not. Regard must be had in this respect for the increasing volumes of water during the rainy season. It is a notorious fact that the quantity of water carried by established ditches during the summer season is reduced by nearly one-third in its volume by the time the point is reached where the water is to be used. It may be true that in many cases the low state of the river from which the water is drawn is partly the cause of this reduction in volume; but in other cases, where the river affords an unlimited amount, the diminution of the water must be ascribed altogether to evaporation and leakage.

The question arises whether it would not be advisable to counteract this lessening of the water by building the ditches wider at their head and reducing their width for a distance of a few miles till the normal size is reached. In the winter season only a quantity answering the size of the lower part of the ditch would be admitted at the head. In summer all the water the upper part of the ditch could carry would be admitted and brought along, even filling the ditch to the top of the lower (artificial) bank—which would be safe enough in summer. This plan seems well calculated to practically increase the capacity of ditches.

Trees.—Trees found on the line of the ditch, the removal of which is necessary, must never be cut down so that only the stumps remain. To grub up these stumps is a most difficult, tedious, and expensive work, and can be avoided by undermining the tree on the lower side, cutting its supporting roots and felling it down the hill, tree, stumps, roots, and all.

Flumes.—The flumes on the line of the ditch may be built either on a little less grade, or a little smaller, than the ditch, as the smoothness of

the boards causes less friction than a rough ditch, and the water, therefore, runs faster.

Flumes are generally built of $1\frac{1}{2}$ -inch plank, with a framing of 4 by 4 and 3 by 4 scantling for every $2\frac{1}{2}$ or 3 feet. The strength of the scaffolding for the flumes must be conditioned by their height, and left to the discretion of the builder. The foundation of this scaffolding ought to be on very solid ground, and, if possible, little exposed to water in puddles, coming and going, as the season changes. Moreover, the bottom part of the supporting-posts, or the sleepers, ought to be well charred, as mentioned before, to prevent rot and subsequent settling of the flume. High flumes ought to be well anchored with strong wire, or wire rope, to protect them against winds.

Where a flume is to be built, the underbrush, fallen trees, &c., ought to be cleared away—by ax, or fire, or both—to protect the flume against the conflagrations which occur in our forests from time to time during the dry season.

Flumes of sheet-iron are highly recommended. The iron could be protected against corrosion by immersion in Dr. Angus Smith's preparation of coal-tar, and would certainly afford a very durable and incombustible material. When the present high price of iron shall have fallen to near its former rate, this material will undoubtedly be used with great advantage.

The building of flumes should be avoided as far as possible, since, under the most favorable conditions, using the best kind of sugar-pine lumber, a flume will only last from ten to twelve years; and the cost of its repair is computed to be 75 per cent. higher than that of a ditch.

A flume carrying a constant stream of water is far less exposed to decay than one which carries water periodically. The alternate swelling and shrinking of the wood in the latter not only destroys the fiber of the wood, but also draws the nails, and thus injures the structure.*

IRON PIPES.

The use of iron pipes as aqueducts is not a novelty in California. As early as 1856 or '57 an iron pipe of 40 inches diameter was laid across a small depression at Timbuctoo, near Smartsville, Yuba County. The city of San Francisco is supplied by the Spring Valley Water Company, which has seventeen miles of 30-inch iron pipe, conducting the water across depressions of from 200 to 250 feet vertical depth.

During the summer and fall of 1870 the most important enterprise of this kind was carried out by the Spring Valley Canal and Mining Company, of Cherokee, Butte County.

Under the direction of Joseph Moore, esq., superintendent of the Risdon Iron and Boiler Works in San Francisco, an iron pipe 30 inches in diameter and 14,000 feet long was manufactured and laid across a depression of nearly a thousand vertical feet, formed by the gorge through which the West Branch of the North Fork of Feather River flows. (See illustration on a former page.) This enterprise was a complete success, and found as such a deserved publicity, which makes its particular description at this place unnecessary. For the sake of handy

* Ditches for irrigation in England have been made of concrete, which is cheap and very durable. A long wooden box is made of the shape of the ditch, the concrete (composed of cement and gravel) is mixed and laid down, and the sides are built up of cement, outside the box, which is drawn along as the work proceeds. Cement is made by burning together chalk and clay, having in it a small proportion of sand. Very durable ditches are also made of sand and asphalt, in the same way.

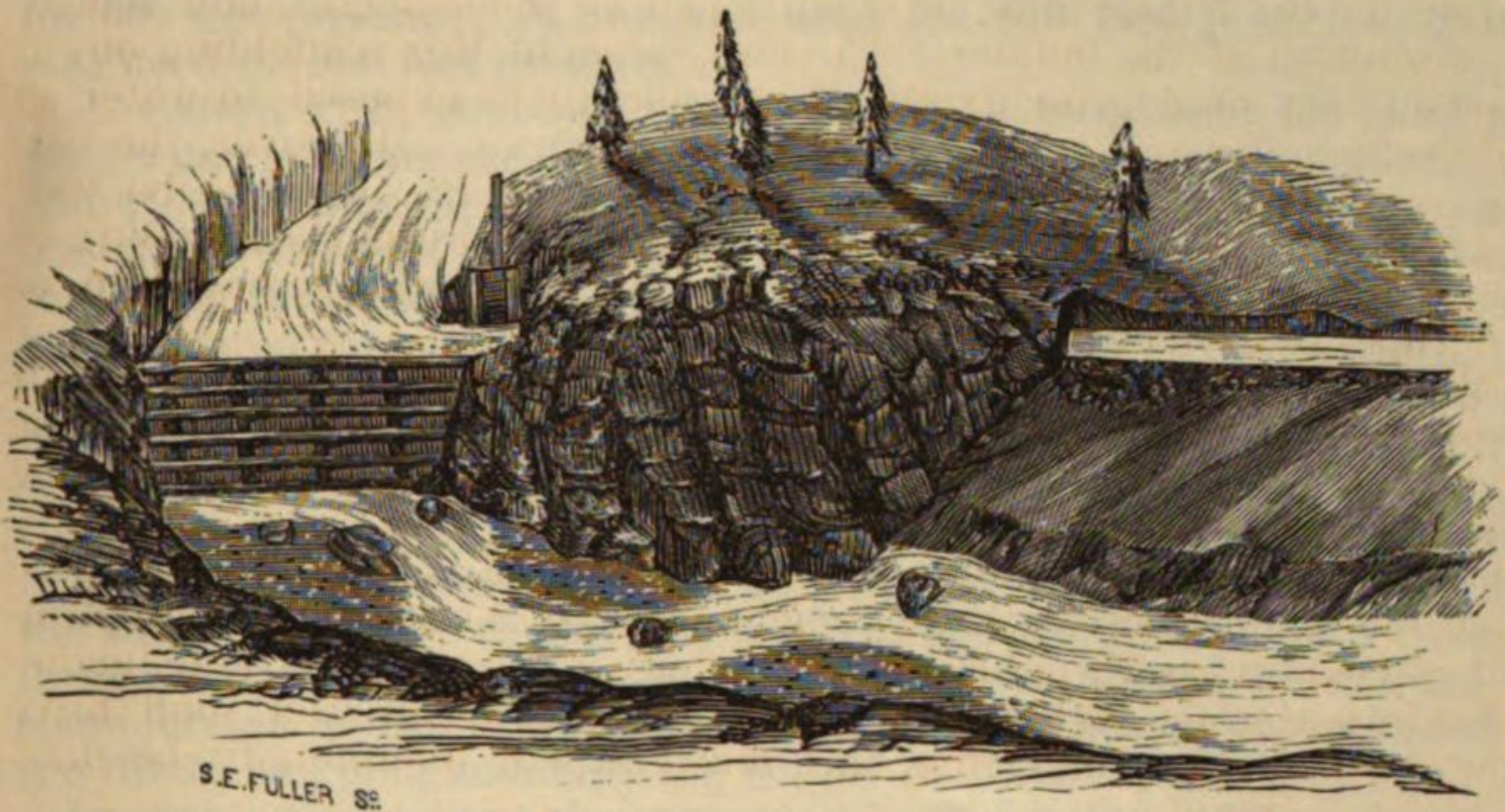


Fig. 13. Low water. (See p. 408.)

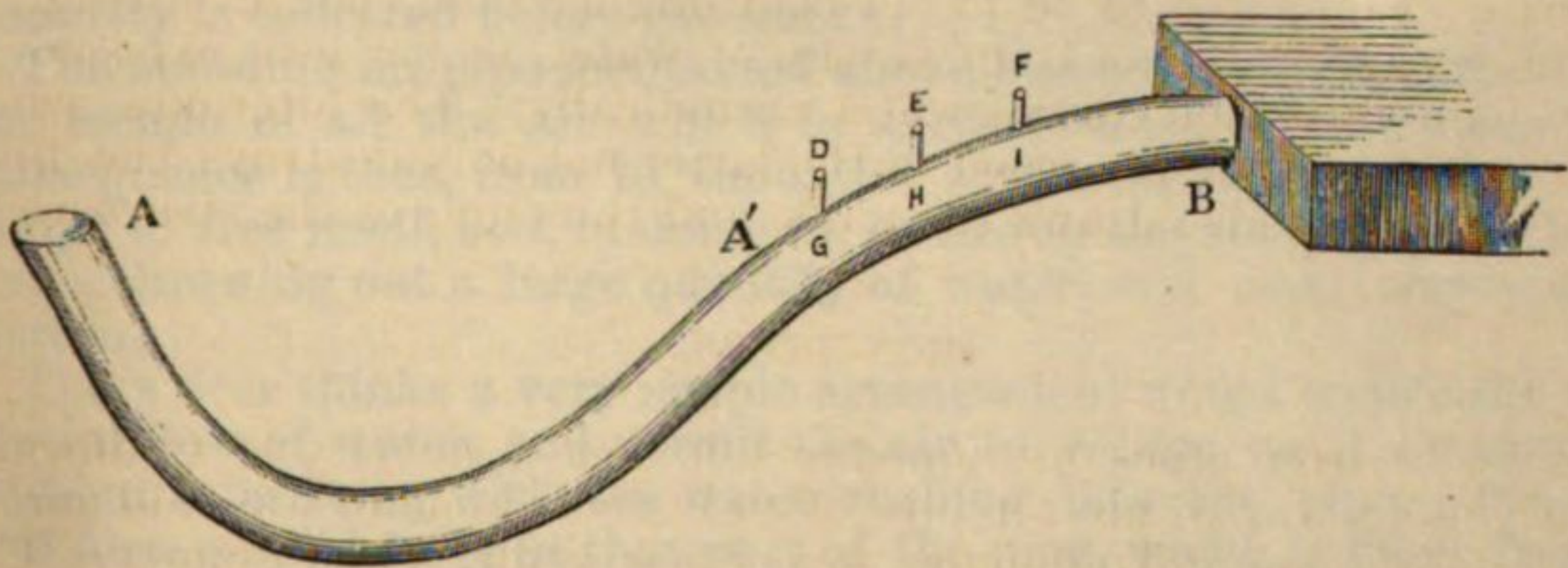
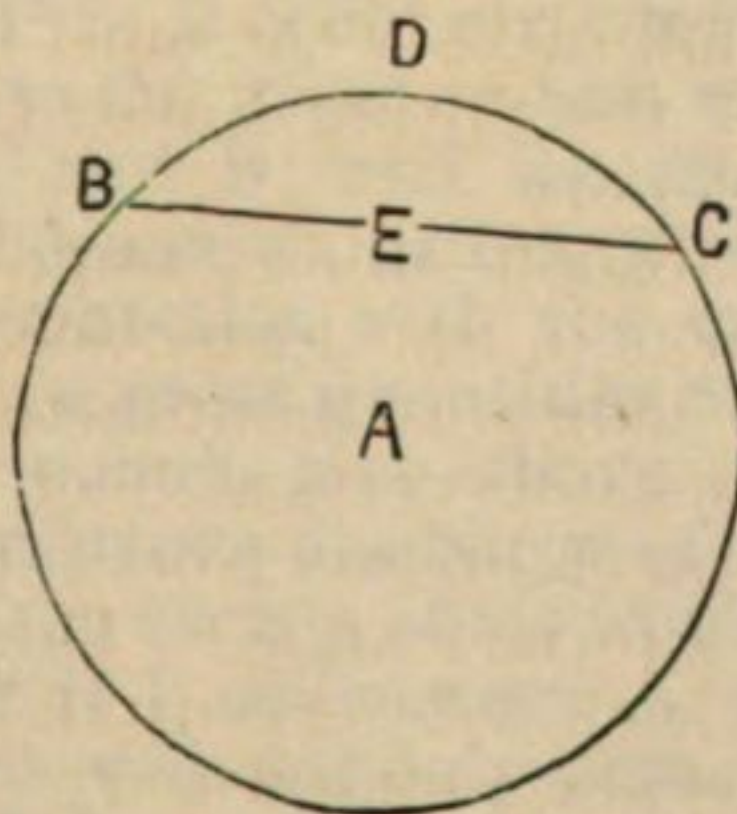
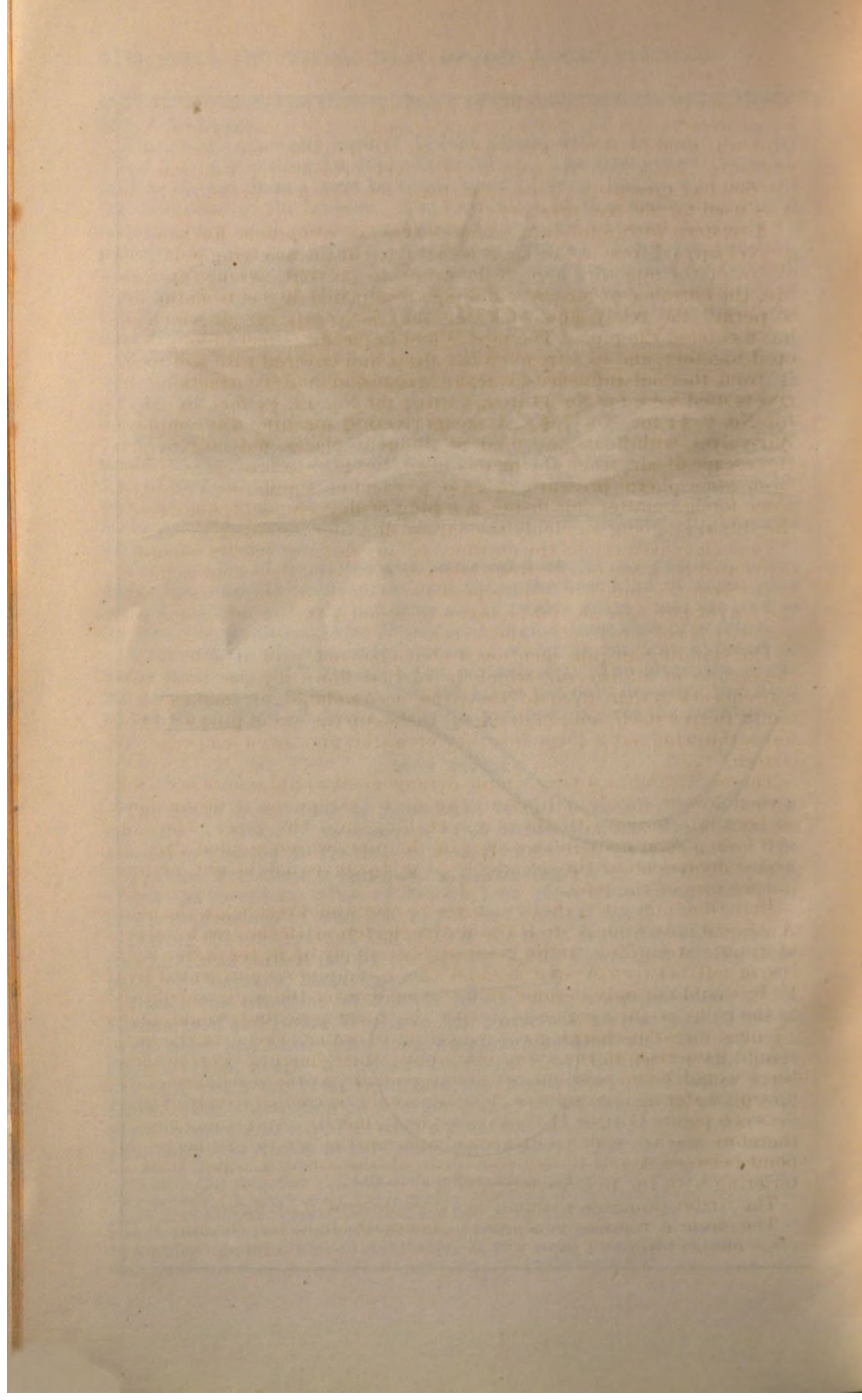


Fig. 14. Air-escapes. (See p. 411.)



(Fig. 15. Air-escapes. See p. 411.)



reference, however, it may here be said that the pipe is made of the best sheet-iron, as follows: No. 14 iron was used for 150 feet pressure; No. 12 iron was used for 275 feet pressure; No. 10 iron was used for 350 feet pressure; No. 7 iron was used for 425 feet pressure; $\frac{1}{4}$ iron was used for 600 feet pressure; $\frac{5}{16}$ iron was used for 850 feet pressure; $\frac{3}{8}$ iron was used for 900 feet pressure.

A cistern with sand-box, which serves as receptacle for sand and gravel carried from the ditch, is constructed at the receiving point. An elbow of the pipe dips here in the water, to prevent, as much as possible, the entrance of air. A stand-pipe is adjusted 50 feet from the inlet, to permit the ready flow of water and the escape of air which may have entered the pipe. The pipe is laid in pieces 23 feet in length, riveted together, and in a trench 5 feet deep, and covered with soil to save it from thermal influences, causing expansion and contraction. The rivets used were for No. 14 iron, $\frac{1}{4}$ wire; for No. 12, $\frac{1}{4}$; for No. 11, $\frac{3}{16}$; for No. 9, $\frac{3}{8}$; for No. 7, $\frac{3}{8}$. A steam-riveting machine was employed. Air-valves, with floats, are used at different places, not only to allow the escape of air, when the pipe is filled, but also to prevent a collapse from atmospheric pressure, in case a vacuum should be created by some foreign matter (for instance, a plug of dry leaves accumulated in the ditch) stopping suddenly the supply of water.

In such constructions the entrance of any floating matter should be prevented by a screen of strong wire, or iron bars, placed at some distance from the mouth of the pipe. Particularly in the autumn, when the leaves fall, care should be taken to remove the latter, whenever a quantity is collected before the screen.

The standing air-pipe mentioned above has not proved sufficient for the escape of all the air which is carried down by the water. The consequence is that, from to time, the accumulated air makes an attempt to free itself, and, in doing so, rushes up the stand-pipe with great force, throwing out a large quantity of water, and even emptying the cistern.

The writer thinks a very simple arrangement would secure the undisturbed flow of water, and permit the air to escape as it accumulates, without interfering with the water rushing into the pipe. The water will form a solid body in that part of the pipe, which is filled from the lowest depression of the inverted siphon to an equal height, or level, in each arm of the pipe.

In the diagram given the undisturbed water would rest below the points A A¹, and only from A² to B could air interfere with the free admission of water. According to the great or less supply of it, the water would rise or fall between A² and B; and the stand-pipes, represented by D E F, would not only become valueless, whenever the water should rise to the point of their connection with the main pipe, but would, under circumstances, discharge great quantities of water, whenever the latter should have risen in the main pipe above their height. Furthermore, there would be no continuous discharge of air, as the resistance of the flowing water against the escape of air would be comparatively as great between points G H or H I, as between A¹ and B. An arrangement is therefore needed, which will not only permit the air to escape at any point between A and B, but also prevent the rushing water from interfering with the free discharge of air.

The writer proposes a simple plan, as illustrated by figure.

The circle A represents a pipe 30 inches in diameter, the line B C a piece of sheet-iron, 23 inches wide from B to C, and 5 inches below the point D. This piece of sheet-iron enters the pipe on a bevel, for a dis-

tance of $2\frac{1}{2}$ or 3 feet, falling in this distance 1 inch. The sides B C are securely riveted to the pipe. A second piece of sheet-iron must be inserted in such a way that the first piece overlaps it for about 2 inches, leaving at the same time an open space of 1 inch in depth, and 24 inches in length between the two pieces of sheet-iron, where the overlapping takes place. Any number of additional pieces of sheet-iron are inserted in the same manner, forming, as it were, a shingle roof on the top of the pipe, with an open space of 1 inch in depth and 24 inches in length between each two shingles.

The water enters at the point o, and is prevented from entering the air-chamber by the overlapping of the different iron shingles; the air, however, will, under the least pressure, escape through the open spaces between the iron shingles, and can be conducted to any final outlet, without interfering in the least with the rush of water.

This air-chamber needs only to be constructed in and a little above that part of the pipe which is subject to the rising and falling of the water, according to the greater or less supply. For instance, in a pipe like that of the Spring Valley Canal and Mining Company, constructed for a head of 150 feet—when experience has shown that a hydrostatic pressure of never more than 50 feet is realized—the shingle roof, or air-chamber, needs only to be applied from near the “solid water” in the bottom of the pipe to a point giving a vertical height of 75 feet above the “solid water.” Of this distance, only 50 feet or less would be filled with water, to form the head or hydrostatic pressure, and the remaining 25 feet would secure a sufficient vent for all the air which possibly might come down with the rushing water.

It will be seen that the capacity of the pipe is not lessened by the introduction of the air-chamber; the latter consisting of nothing but pieces of sheet-iron riveted from side to side, and permitting the rising water to fill the air-chamber from below, and thus to occupy the whole capacity of the pipe. The arrangement in itself is simple, and can be introduced into any pipe already in position, provided it is large enough to admit a workman.

For pipes conducting water to the hydraulic machines in the mines, the following plan is recommended to get rid of the air: A pipe of 4 or 5 inches diameter is perforated with holes, each, say, of 2 inches diameter, and at intervals of $2\frac{1}{2}$ or 3 feet. These holes are covered with caps of the shape of half-funnels, and in such a way that the wider part of the funnel leaves an open space, lapping about 1 inch over the hole. The pipe thus prepared is inserted from 50 to 100 feet, according to the length of feeding-pipe, into the latter, the open funnel downward, and is secured firmly to the upper side of the feeding-pipe. The upper end of this air-pipe must rise a few feet above the bulk-head from which the feeding-pipe is supplied.

The air which necessarily enters the feeding-pipe with the rush of water will seek the easiest way of escape, and must, consequently, enter the inserted pipe through the open funnels. The caps over the holes of the air-pipes prevent the water, rushing down, from entering the air-pipe, and the air can be conducted safely to a final outlet.

The above arrangement would not lessen the capacity of the feed-pipe, as the water, rising in the latter, would enter the air-pipe through the funnels, and rise in both pipes simultaneously.

The advantage to be gained from this arrangement would be the almost total exclusion of air from the feed-pipe, and, therefore, the certainty of a solid and even discharge of the water from the hydraulic machine, securing the greatest efficiency and force of the water-jet.

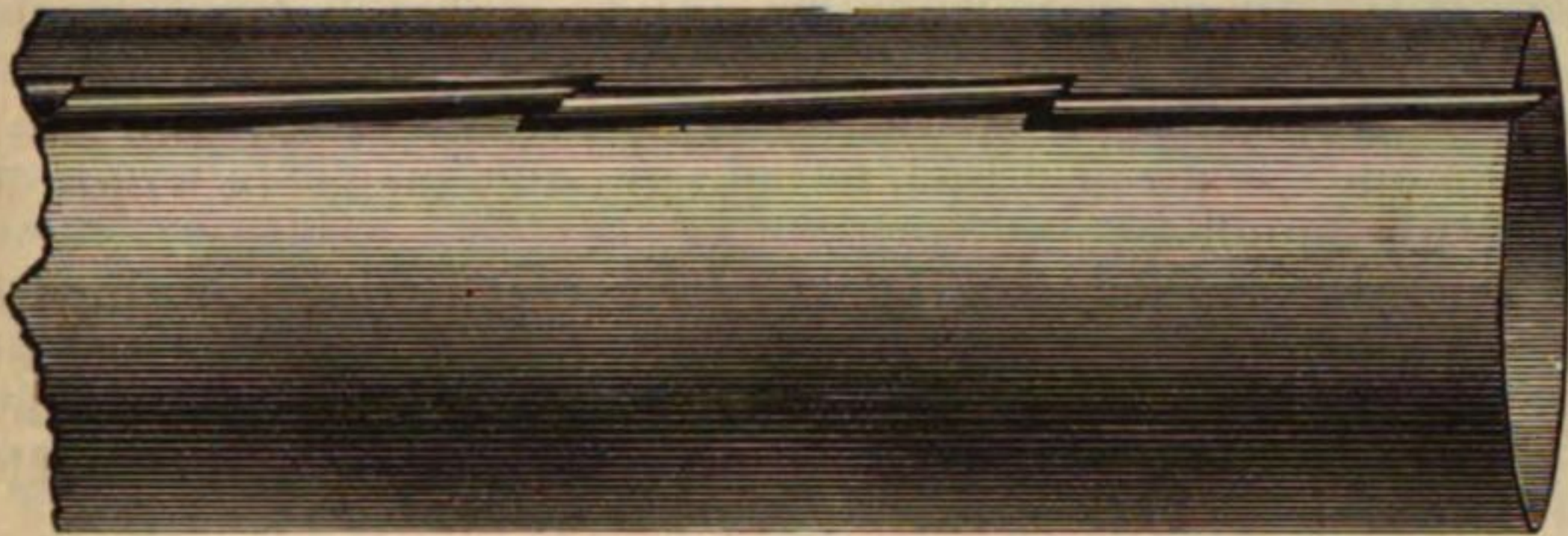


Fig. 16. Pipe with interior "shingle-roof." (See p. 412.)

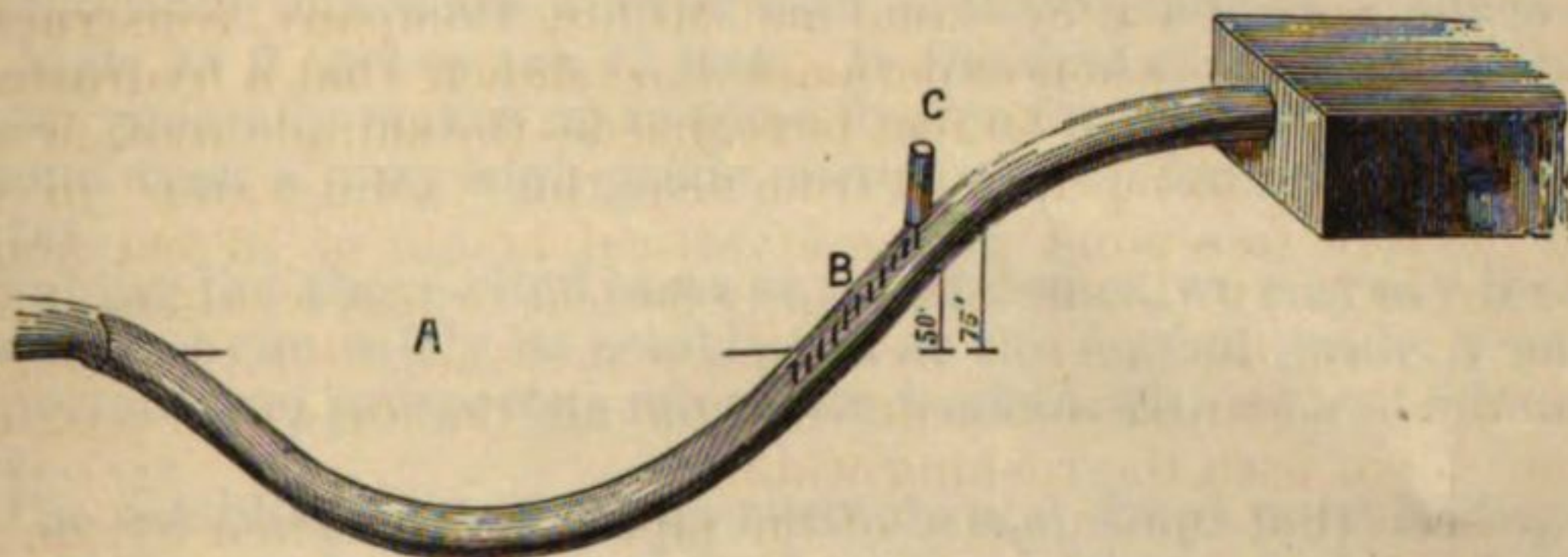


Fig. 17. Pipe with "shingle-roof" and air-chamber. (See p. 412.)

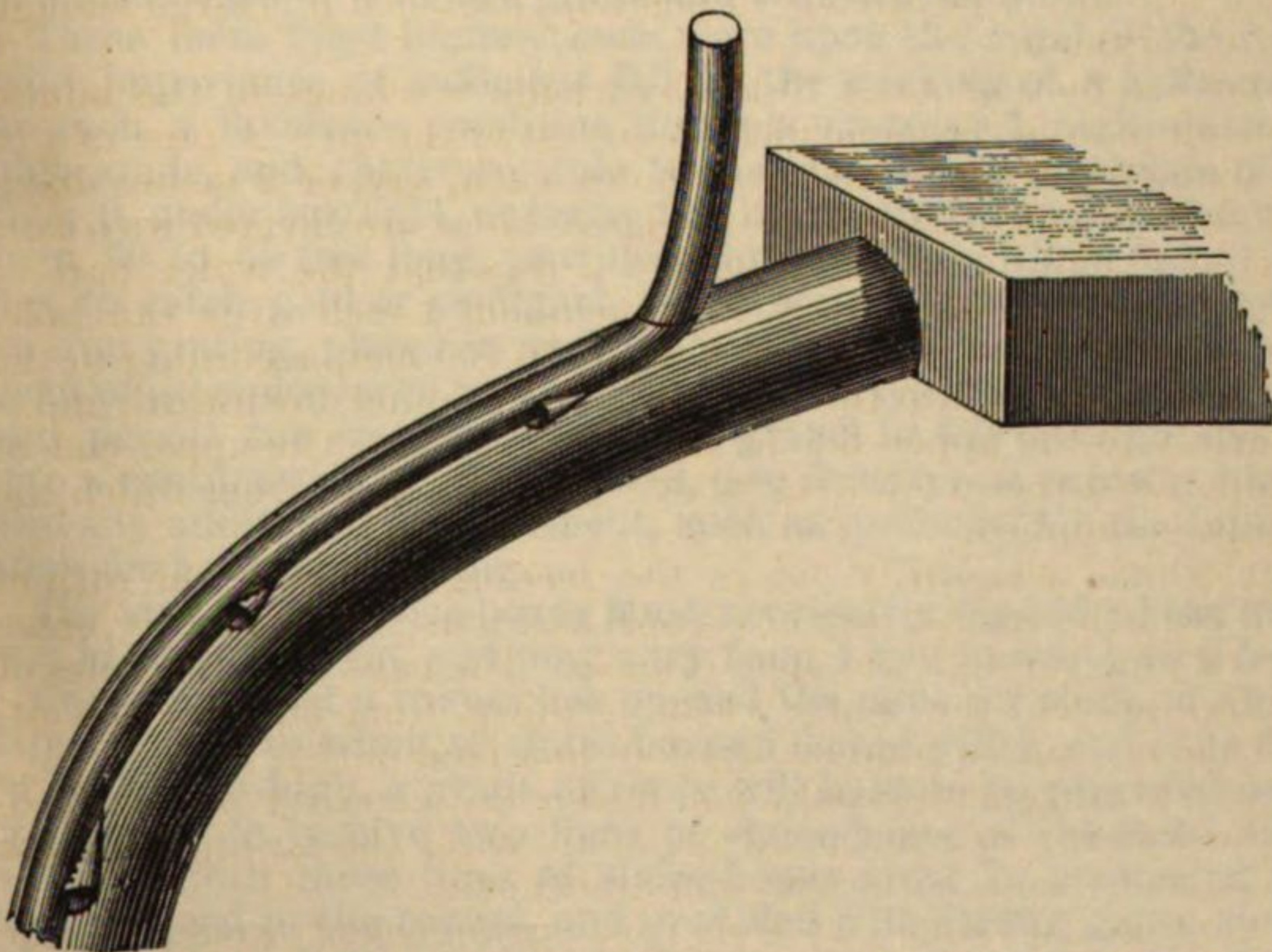


Fig. 18. Feed-pipe with air-pipe for hydraulic machinery. The small or feed-pipe is inside the large pipe. (See p. 412.)

The first of these is the fact that the
the second is the fact that the
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MECHANICAL APPLIANCES.

Sluice-boxes.—These are the highways upon which hydraulic mining is carried on, and their greater or less efficiency has an influence upon this business like that of the establishment of railroads or common wagon-roads upon general commerce.

Just as, by the cheapening of carriage, railroads open coal-fields, grain-producing regions, &c., to the markets of the world and to a brisk commerce, where common wagon-roads would hardly sustain a weak home-trade, so well-adapted sluice-boxes will render inferior gravel-deposits “paying institutions,” while, *per contra*, rich gravel-deposits, without proper facilities for the placing of sluice-boxes, are worked at a loss.

The great requirement is sufficient grade, and a careful survey of the route should always be made before the sluices are put in place, so that the existing fall or grade can be husbanded to the best advantage for the establishment of under-currents, drops, grizzlies, &c.

Hydraulic mines are worked with as little grade as 3 inches and with as high as 9 inches per 12 feet. In the first case abundant and cheap water generally makes up in some degree for the want of grade; in the second case a very high grade must make up for the limited supply of water.

Taking the above-cited cases as the extremes, we may say that 6 inches per 12 feet can safely be established as the normal grade, though many important and prosperous mines are worked with $4\frac{1}{2}$ and 5 inches per 12 feet.

The establishment of under-currents and drops must be kept in mind when the grade for the sluice-boxes is laid out, and it is advisable to establish a number of under-currents on a long-line of sluice-boxes, even at the sacrifice of some grade. For instance, sluice-boxes, with 5 inches grade per 12 feet, and with a number of under-currents, are preferable to sluice-boxes of 6 inches grade and without the latter.

These facts must impress once more upon the mind of the miner the vital importance of sufficient fall for the working of a hydraulic mine, as such a favorable condition not only insures: 1, sluice-boxes over a high grade, and, therefore, able to carry immense quantities of gravel, &c.; 2, under-currents, or large, flat boxes, from 10 to 20 feet wide and from 30 to 50 feet long, provided through their whole extent with rifles, to catch gold or amalgam, (see description below;) 3, a grizzly, or an iron grating, placed in such a position as to throw down an embankment or precipice large rocks which have been carried in the sluice-boxes, and permit the smaller rocks and gravel to fall through the grating into a continuation of sluice-boxes, (see description below;) but admits also any additional improvement, such as undoubtedly the future has in store for hydraulic mining.

The size of the sluice-boxes must necessarily depend on the work they will have to perform, and may vary from 4 feet in width to 6 feet.

Supposing that a tunnel has opened the mine for work, of dimensions large enough to admit of sluice-boxes 6 feet in width, and from 36 inches to 40 inches high, a grade or route will have to be prepared outside of the tunnel to receive two lines of sluice-boxes of the same width and height. Both these lines of sluice-boxes must be connected with the boxes placed in the tunnel, and provided with strong gates, so as to cut off this connection at will. This arrangement permits the use of the sluice-boxes outside of the tunnel alternately, and the “clean-up” of one line of the boxes without interruption of the work in the mine.

However, when the boxes *in the tunnel* are cleaned up, the washing in the mine must stop till this is done and till the blocks or riffles are replaced. A day is generally sufficient for this work, since the tunnels, with a few exceptions, are short, compared with the outside lines of sluices, and since, moreover, the pavement, or riffles, in the tunnel-sluice consist of blocks or sets of scantlings, which are far more easily removed and replaced than the stone-pavement, which usually forms the bottom of the outside sluices.

After the grading is done, according to the fall at disposal, sills are laid across the track 4 feet apart. These sills ought to be 4 by 6 inches, and, for a double sluice, about 15 feet long, so as to project on each side of the flume or sluice, to receive posts and braces. The posts are made of 4 by 5 inch scantlings, and either 36 or 40 inches long, according to the height of the sides of the sluices. The braces are made of $1\frac{1}{2}$ by 6 inch lumber, and the sides and bottom of the sluice of $1\frac{1}{2}$ -inch plank. A piece of board 8 inches wide, nailed from post to post flush with the inside of the sluice, not only gives strength to the whole structure, but may also serve as a gangway.

Whenever a curve occurs in the sluice, the larger bend, or outside, ought to be raised from $\frac{1}{2}$ inch to 1 inch, according to the degree of the curve. This will check the force of the current toward the outside curve and distribute the flowing matter evenly over the whole bottom of the flume, preventing the wearing of a deeper channel in the pavement on the outside curve.

The pavement of the sluices should be made of hard, flat stone; schist-rock or mica slate is excellent for the purpose. These stones must be placed edgewise, with a gentle slant from their base down the stream, forming a uniform thickness of 10 or 12 inches.

This pavement should be built in separate compartments of 6 or 8 feet length, confined by pieces of strong plank or scantling fixed permanently across the bottom of the flume, to protect the pavement against a wholesale destruction in case the current of the stream should dislodge some stones in one or other of the compartments. For 12 feet of double sluice, equal to 144 square feet, about 9 tons of stone are required for paving.

The sluice-boxes should be lined above the stone pavement with 2-inch planks or 2-inch blocks, for a height of 10 or 12 inches, to protect the real sluice against the wear and tear of the swift gravel-stream.

The single sluice in the tunnel must be paved with square pine blocks, about 10 inches deep. These blocks are laid across the flume, close together, and a piece of plank $1\frac{1}{2}$ by 6 inches is nailed to the lower part of the blocks with headless nails. These headless nails are not driven home, but project about an inch on the face side. A new tier of blocks is inserted and driven on the projecting nails till the blocks touch the intervening board or plank, and are therefore within $1\frac{1}{2}$ inches of the first tier. Another piece of plank is put in position and the same process continued. The lining of the sluices is placed so low down that it touches the tops of the planks in the bottom, and keeps them in position. These spaces of $1\frac{1}{2}$ inches in width separate the different layers of block, and form the real riffles to catch gold or amalgam. The lining in those sluices which have rock pavements is, in many instances, placed so low that the rock pavement covers about 2 inches of it. This is done to prevent the wear of the rock pavement leaving a part of the sides of the flume, or sluice, unprotected. This, however, may be an unnecessary precaution, as the lining of the flume

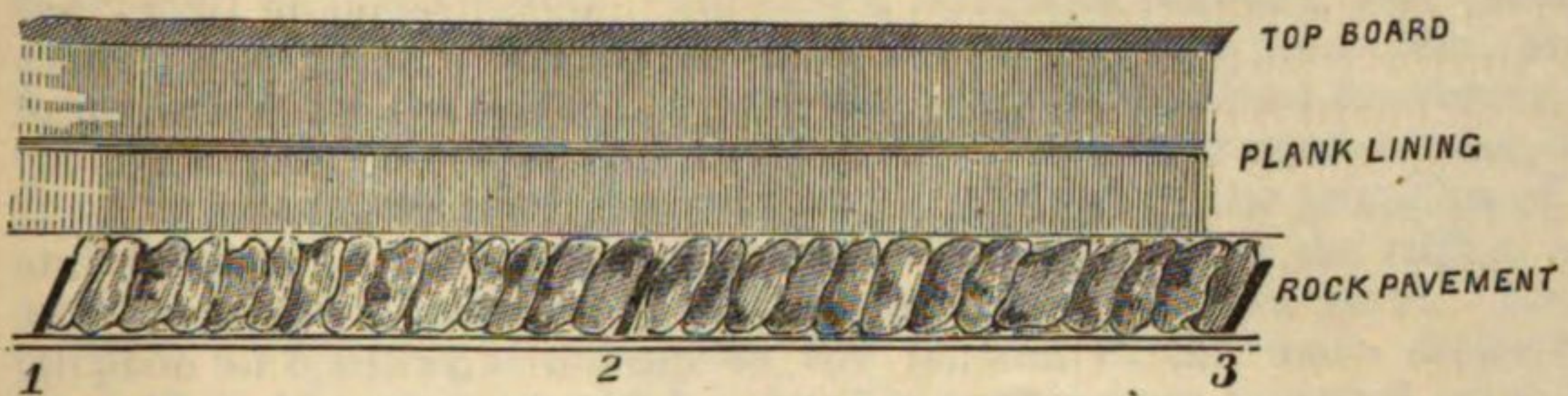


Fig. 19. Sluice-boxes ; grade 6 inches per 12 feet ; sides 36 inches high ; 1, 2, 3, compartments. (See p. 414.)

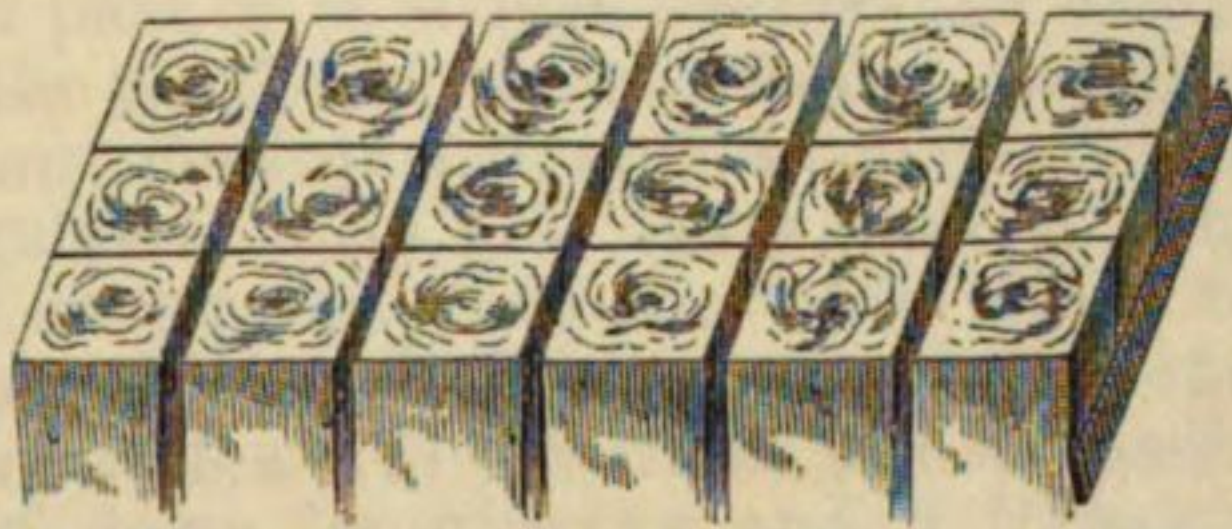


Fig. 20. Block-pavement for sluices. (See p. 414.)

The first part of the paper is devoted to a general
discussion of the subject. It is shown that the
theory of the subject is not yet complete, and
that there are many points which require further
investigation. The author then proceeds to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The second part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The third part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The fourth part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The fifth part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The sixth part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The seventh part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The eighth part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The ninth part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.
The tenth part of the paper is devoted to a
detailed examination of the various theories which
have been proposed, and shows that each of them
has its own merits and its own defects. He then
presents his own theory, which he believes to be
the most complete and the most satisfactory.

wears out much faster than the rocks, and can, when it has to be renewed, always be placed close to the rock pavement.

The expense of constructing a double sluice of the above dimensions depends both on the cost of the material used and the difficulty of establishing the proper grade. In localities where lumber can be furnished for \$20 per M, and where the grading can be done without blasting, double sluices have been laid and paved in the most substantial way for \$2 per foot. A single sluice, 6 feet in width and 3 feet high, can be constructed, under similar favorable circumstances, for about \$1.25 per foot.

Under-currents.—These are large flat boxes, or platforms, placed beside and a little below the main sluice-boxes. Their size and shape depend, to some extent, on the facilities which the place offers where they shall be constructed. Triangles, irregular oblongs, and parallelograms, containing a surface of from 500 to 1,000 square feet, are the forms often resorted to. The under-current is destined to receive from the main sluice-boxes a certain portion of the finer gravel-wash, black sand, quicksilver, and amalgam, and to afford to the particles of gold and amalgam a better chance to settle permanently in the riffles, which are evenly distributed over the whole surface of the platform. For this purpose an opening is cut across the bottom of the main sluice-boxes from 15 to 18 inches in width. In this opening are inserted steel bars, 1 inch square and 1 inch apart, generally fixed in a cast-iron frame. The small particles of gravel, sand, gold, &c., which pass through this grating are caught in a box placed below the sluice-boxes, on a pitch of about 1 inch per foot, whence they are carried upon the large platform provided with riffles.

This platform is placed on a grade of from 10 to 12 inches per 12 feet, and is provided with an opening at the lower end to return the bulk of the material received to the main sluice-boxes below.

To distribute evenly the water and gravel received from the main sluices a number of check-boards are placed at the upper part of the platform, in a direct line with the box under the grating of the main sluice, which receives the discharged matter. As the water, &c., rushes out of this box part of it strikes against the nearest check-board and is turned down the platform; the remainder, rushing on, is diminished by each succeeding check-board, and an even distribution over the whole platform is gained. At the lower end of the platform the discharge of the water, &c., into the main sluice below may be arrested by the insertion of a small box, on a grade, into which the material drops from the riffles. These riffles can be made either of 2 by 3 inch scantlings, laid down lengthways and 2 inches apart, or of common blocks or stone pavement.

The under-current and main sluice-boxes discharge their contents into a deep and strongly-built box, provided with a heavy stone pavement. From the upper part of this box a continuation of the main flume leads the gravel-stream to other under-currents, drops, &c., and to a final discharge. The lower part of this box must be 4 or 5 feet deeper than the point from which the main-sluices are continued—and will be found of great service in catching amalgam, &c.

The gratings in the main-sluices deprive the latter of a quantity of water. To counteract this loss the main-sluices are narrowed about 6 inches to condense the current of water till both streams, that of the under-current and that of the main sluice-boxes, re-unite as described above.

When there is sufficient room under-currents may be placed on each

side of the main sluice. This plan is recommended in all localities where great care has to be taken in the distribution of a limited grade. An under-current of 50 feet length will absorb about 8 feet of grade, and for this reason the plan of establishing two under-currents opposite each other is highly economical, when practicable.

These under-currents are of the greatest service in catching rusty gold, which cannot be touched by quicksilver, and which, lessened in specific gravity by the foreign matter clinging to it, is very liable to be carried entirely through a long line of sluices to the final discharge. The gentler and shallower place on the platform of the under-current gives to this rusty gold more chances to be caught by the extensive riffles.

The grizzly.—This word in the strange nomenclature of the California miner means a grate or frame-work of parallel iron bars, with interstices, which is used here and there in the line of sluice-boxes to throw large pebbles or stones out, and to permit such particles only as can pass easily through the interstices between the iron bars to be carried further along in the sluice-boxes. Wherever a grizzly is applied, a drop of a few feet is necessary; since the material which can pass through must be collected in a box below and thence carried away by a lower section of sluice-boxes. The construction of grizzlies is of use only where the stones to be discharged over the grizzly can be thrown down a steep embankment. When this is the case, the sluice-boxes can thus be relieved of a great quantity of useless material.

To illustrate, we will suppose that a precipice of 40 or 50 feet exists close to drop-box H, represented in the accompanying sketch, so that any material thrown outside of this box would tumble down the precipice. This would give a favorable chance to apply a grizzly, which would have to be done by attaching a frame-work of strong iron bars (condemned iron rails are excellent) to the bottom of the sluice-box, which discharges its contents into drop-box H, and to lead this grate with a fall of about 30 degrees across the drop-box H and towards the precipice.

The iron bars or rails would have to run the full width of the sluice-box, 6 inches apart and parallel with each other, towards the precipice, and all bowlders larger than 6 inches in diameter would be discharged. On both sides of this grating planks must be fixed to prevent any of the stones from escaping sideways.

Hydraulic nozzles.—The observant miner early perceived that if a certain amount of gravel could be washed with a certain quantity of water, double the quantity of water would wash from three to four times as much gravel without increasing the expense for labor in proportion. Greater quantities of water and enlarged hydraulic nozzles were therefore introduced, and the latter became very soon the objects of inventive speculation, which resulted in the successful production of very ingenious hydraulic machines.

The first improvement was a flexible iron joint, formed of two elbows working one over the other, with a coupling joint between them. These elbows were called goose-necks.

This invention was a decided improvement, though it showed some serious defects. The abrupt turn of the elbow broke the force of the water to a great extent; the upward pressure made the joint hard to move, and when the pipe was turned horizontally the hose part would often bend a little too far and the re-action would cause the pipe to "buck" or fly around in a contrary direction. The same re-action would also often occur in elevating or depressing the pipe.

The next improvement was Craig's globe monitor. This invention

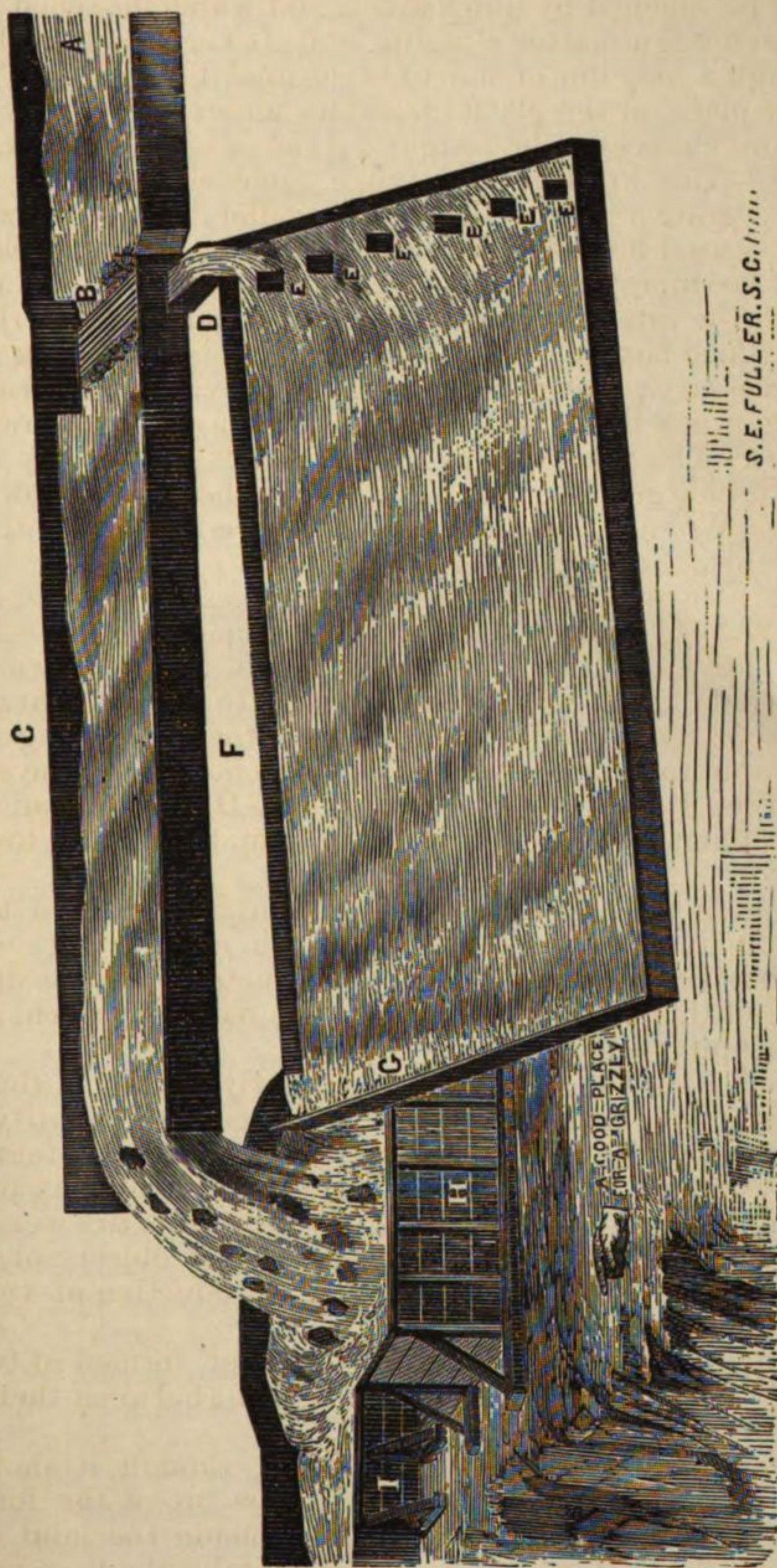
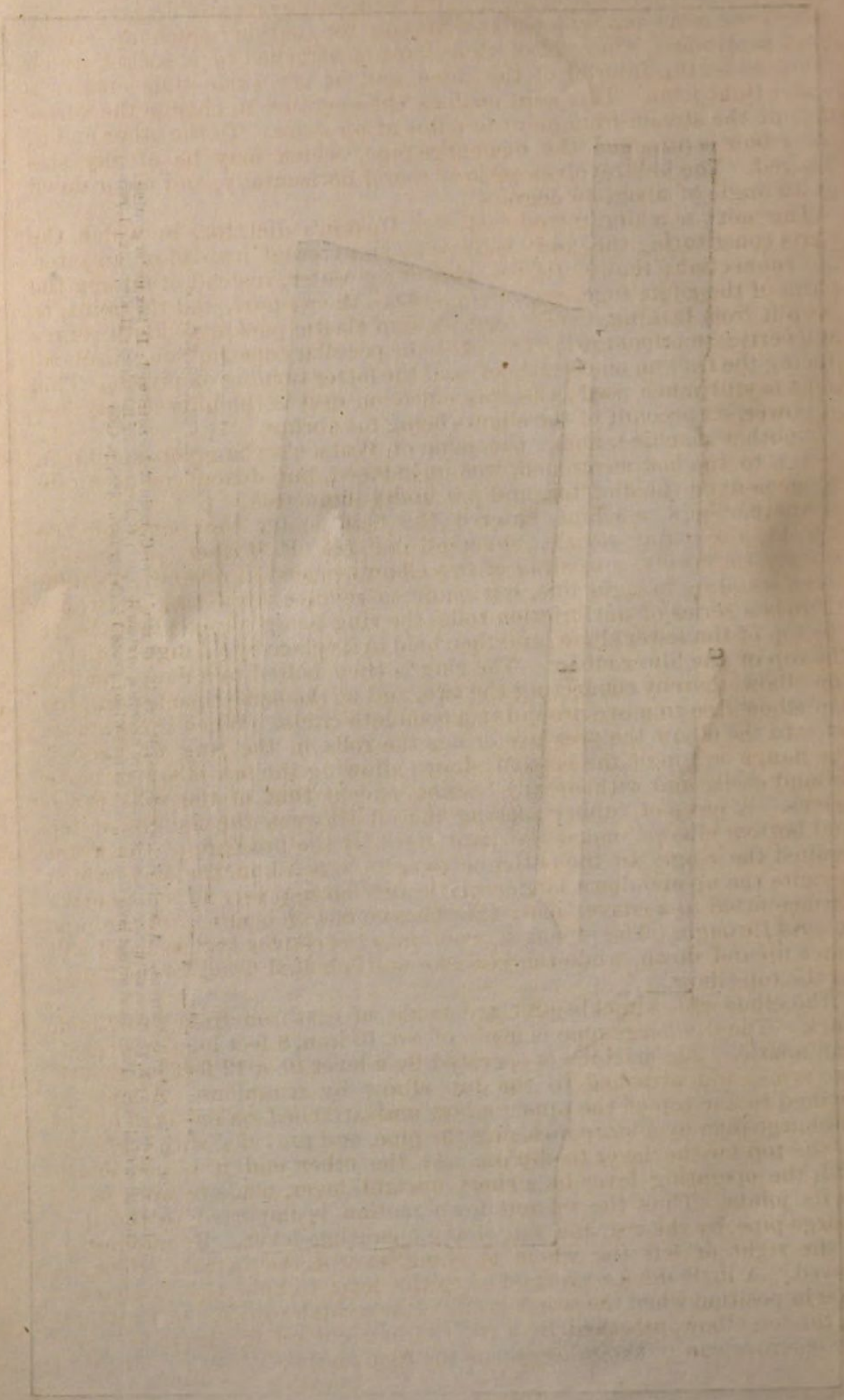


Fig. 21. Sluice and undercurrent. A, main sluice or flume; B, grating of steel bars; C, main sluice narrowed; D, box under grating; E E, check-boards; F, platform of undercurrent, (perspective distorted to show details); G, box leading into drop; H, drop-box; I, continuation of sluice. The undercurrent is 50 feet long and 20 feet wide; grade 1 inch per foot. (See p. 416.)



consists of a hollow ball or globe, with an opening on one side, into which enters the main supply-pipe, and one on top, out of which an elbow-joint protrudes. One end of this elbow is attached to a socket which revolves on the interior of the globe, and at the same time creates a water-tight joint. This joint enables the operator to change the direction of the stream from point to point at pleasure. To the other end of the elbow is attached the discharge-pipe, which may be of any size desired. The ball revolves entirely round horizontally, and up or down at an angle of about 40 degrees.

The next machine introduced was Hoskin's dictator, in which the parts constituting the joint work with an external instead of an internal connection; that is, the pressure of the water, instead of forcing the parts of the joints together, tends to force them apart, and the joint, to keep it from leaking, is provided with an elastic packing. Both rotary and vertical motions are facilitated by the peculiar construction, wheels reducing the friction on the former, and the latter turning on pivots. This joint is still much used; the only objection to it is the unnecessary loss of power, on account of the elbows being too abrupt.

Another machine, under the name of Watson's champion, similar in design to the last mentioned, was introduced, but denounced as an infringement on the dictator, and put under injunction.

Another new machine entered the field under the name of the knuckle-joint and nozzle, invented by Mr. F. Fisher, of Nevada County, California, consisting of two elbows, placed in reversed position when standing in right line, but made to revolve by a ring in which there is a series of anti-friction rolls, the ring being slipped down over the top of the lower elbow, and then held in its place by a flange bolted to the top of the lower elbow. The ring is then bolted to a flange on the top elbow, thereby connecting the two, and at the same time leaving the top elbow free to move around in a complete circle. When the water is let into the elbow the pressure brings the rolls in the ring up against the flange on top of the bottom elbow, allowing the top elbow to move around easily and without any friction, except that of the rolls themselves. A piece of rubber packing placed between the flanges of top and bottom elbows, makes the joint tight by the pressure of the water against the ring. In the outlet or top elbow is a knuckle-joint, which permits the up-and-down motion of the discharge-pipe. It is a concave surface fitted to a convex one; the concave has an opening for the pipe to pass through. The pipe is screwed into the convex surfaces and will move up and down, while the concave one is bolted firmly to the flange on the top elbow.

The elbow and knuckle-joint are made of cast iron from $\frac{5}{8}$ to $\frac{3}{4}$ inch thick. The discharge-pipe is made of No. 16 iron, 8 feet long, with cast-iron nozzle. The machine is operated by a lever 10 or 12 feet long, with two arms, and attached to the top elbow by trunnions. A lever is pivoted to the top of the upper elbow and attached on one end to the discharge-pipe by a strap inclosing the pipe, and provided with two rolls on the top for the lever to slip on. At the other end it is connected with the operating lever by a short upright lever, made to work loose on its joints. Thus the up-and-down motion is imparted to the discharge-pipe by the rise and fall of the operating lever. By moving it to the right or left the whole machine, except the bottom elbow, is moved. A little device is attached to the lever to hold the discharge-pipe in position when the water is off. It is a catch working in a ratchet on the top elbow, attached by a rod running out on the lever, so that the operator can put it in or out as the case may be.

The pipe stands firmly in place when the water is on; the operator, standing at the end of the lever, can easily direct the stream to any point—good execution being done at a distance of 200 feet from the bank, thus securing safety of life from caves, which are so frequent and so often fatal, where small streams are used against high banks. These machines are made to throw streams of from 4 to 7 inches in diameter.

The Little Giant, invented by Mr. R. Hoskin, of Dutch Flat, Placer County, is claimed to combine all the requisites of the hydraulic nozzle.

Simple in its arrangement, it is easily managed, and an additional pressure of water does not interfere with its motion, as the connections, or joints, instead of being forced together, are forced apart by such a pressure. The avoidance of abrupt angles in its construction makes the Little Giant approach nearer to the straight line than any other hydraulic machine so far introduced. Upon the strength of this fact, it is claimed, and apparently with good reason, that less resistance is offered to the flow of water by the Little Giant than by any other hydraulic apparatus, and that by it, therefore, not only a greater quantity of water, but also a far more powerful stream can be discharged.

The joints, being packed with leather, are dependent on the packing for tightness, and are thus preserved from wearing or grinding out. To prevent this rotary motion of the water, produced whenever the elbows are turned different ways, the "rifle," composed of radial plates, is inserted in the discharge-pipe. These plates force the water to issue in a straight line from the discharge-pipe, and prevent thus the scattering or breaking up of the stream, on the solid and columnar shape of which so much of its effectiveness depends.

The Little Giant has been worked with 6-inch nozzle under a pressure of 435 feet.

Distributor.—This is a strong cast-iron box, receiving directly from the supply-pipe all the water to be used by means of hydraulic machines in the mines. It is provided with two or more openings, to which the pipes, directly connected with the hydraulic nozzles, are attached. These openings can be closed by strong iron gates, raised or lowered by means of a screw. To change the water from one hydraulic nozzle to another the gate for the latter is opened by turning the screw. At this point two streams of equal power will issue from the two nozzles. Now, the screw of the first hydraulic nozzle is turned, the gate closes slowly, and the whole of the water is changed from one nozzle to the other.

These distributors are provided with as many as four gates, so that four hydraulic nozzles could be supplied from one of them, provided the supply of water and the feed-pipe were large enough to furnish the four nozzles at the same time. The distributor must be firmly fixed to the ground.

The supply or feed pipe.—The size of this pipe must necessarily depend on the supply of water. In mines which use from 1,500 to 2,000 inches of water, feed-pipes of 22 inches diameter are generally used. When the supply of water is higher than that, and rises to 3,000 inches or more, it is advisable to use a pipe of 30 inches diameter, since the friction is lessened to a great extent by the large size.

The feed-pipe should descend from a strong bulk-head in as direct a line as possible, and with the least angles, to the mine. It should not be permitted to *fall* and *rise* again, unless this is unavoidable; and then it should be provided with an extra number of air-valves, with *brass* floats. (The depressed portion of the pipe would retain the water all the time, and might be at any moment the cause of a collapse, unless efficient air-valves could supply air quick enough to prevent a vacuum.

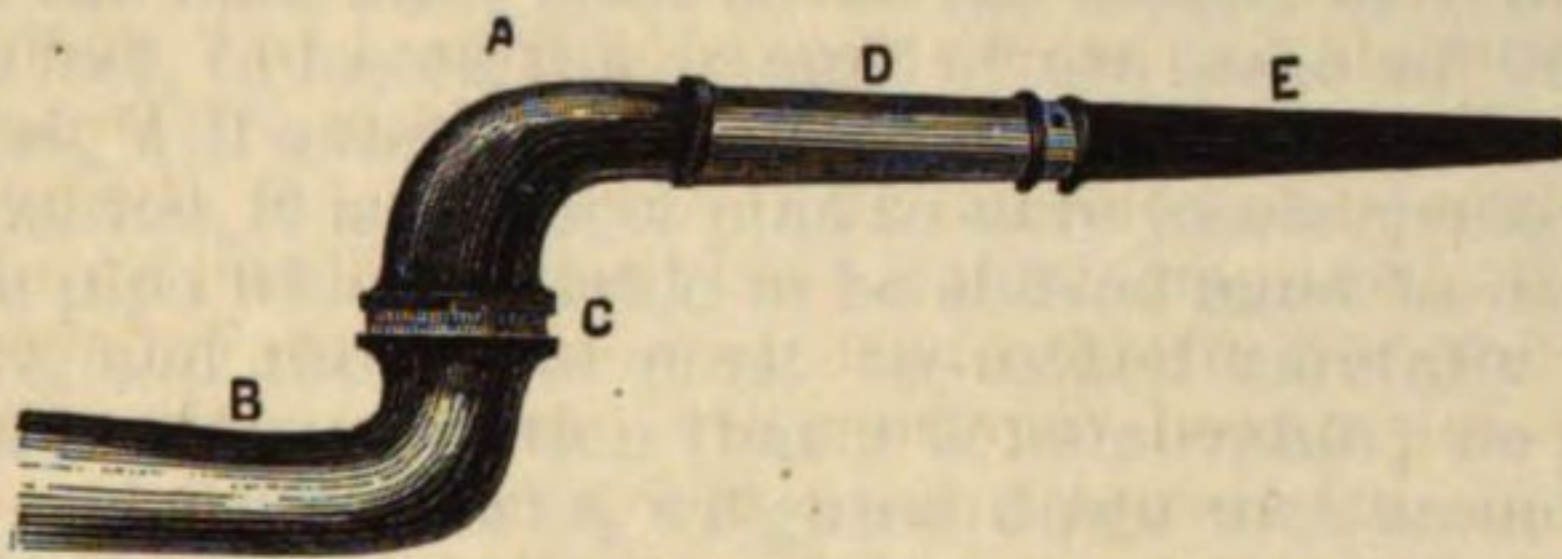


Fig. 22. Goose-neck. A B, elbow; C, joint; D, piece of hose; E, discharge-pipe. (See p. 416.)

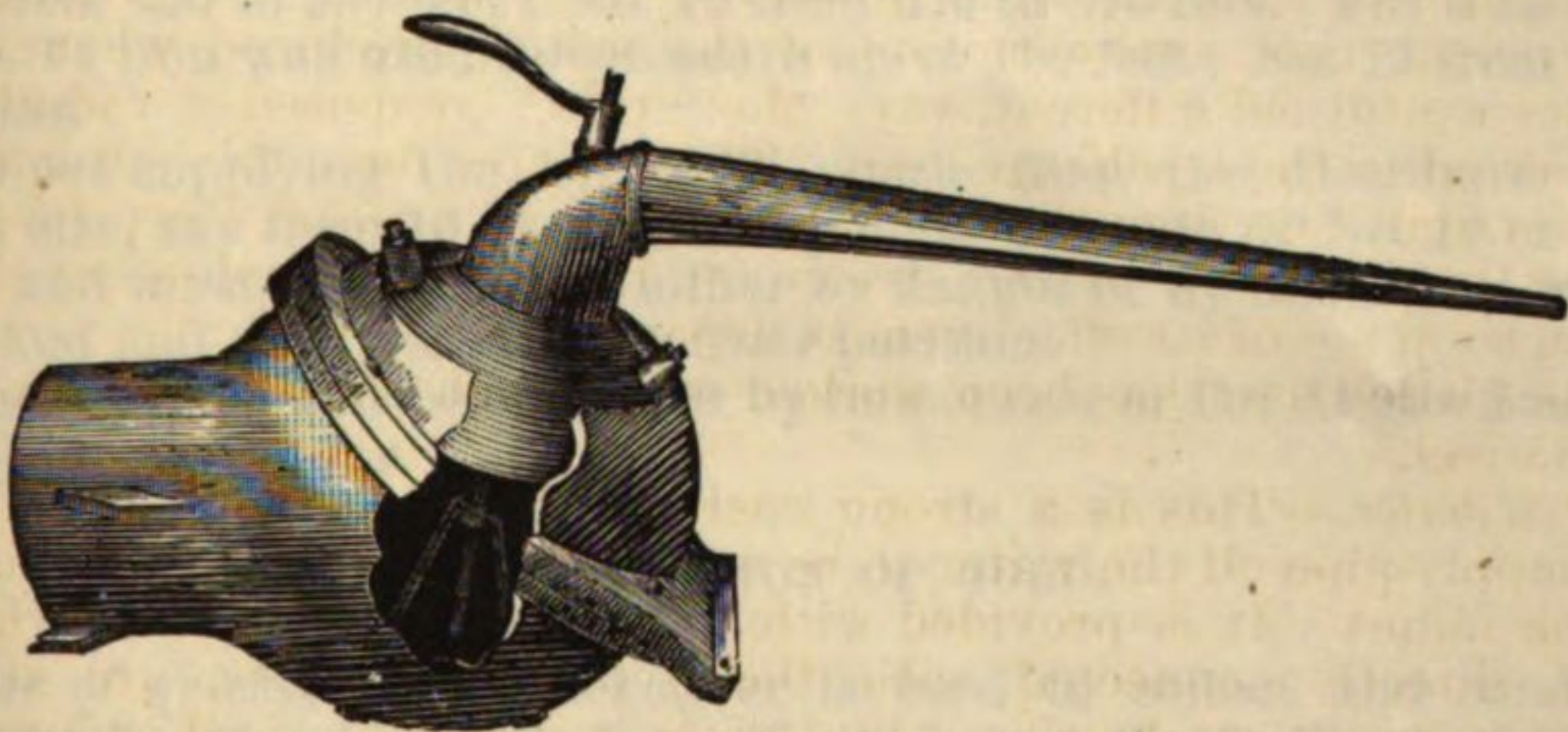


Fig. 23. Craig's globe monitor. (See p. 416.)

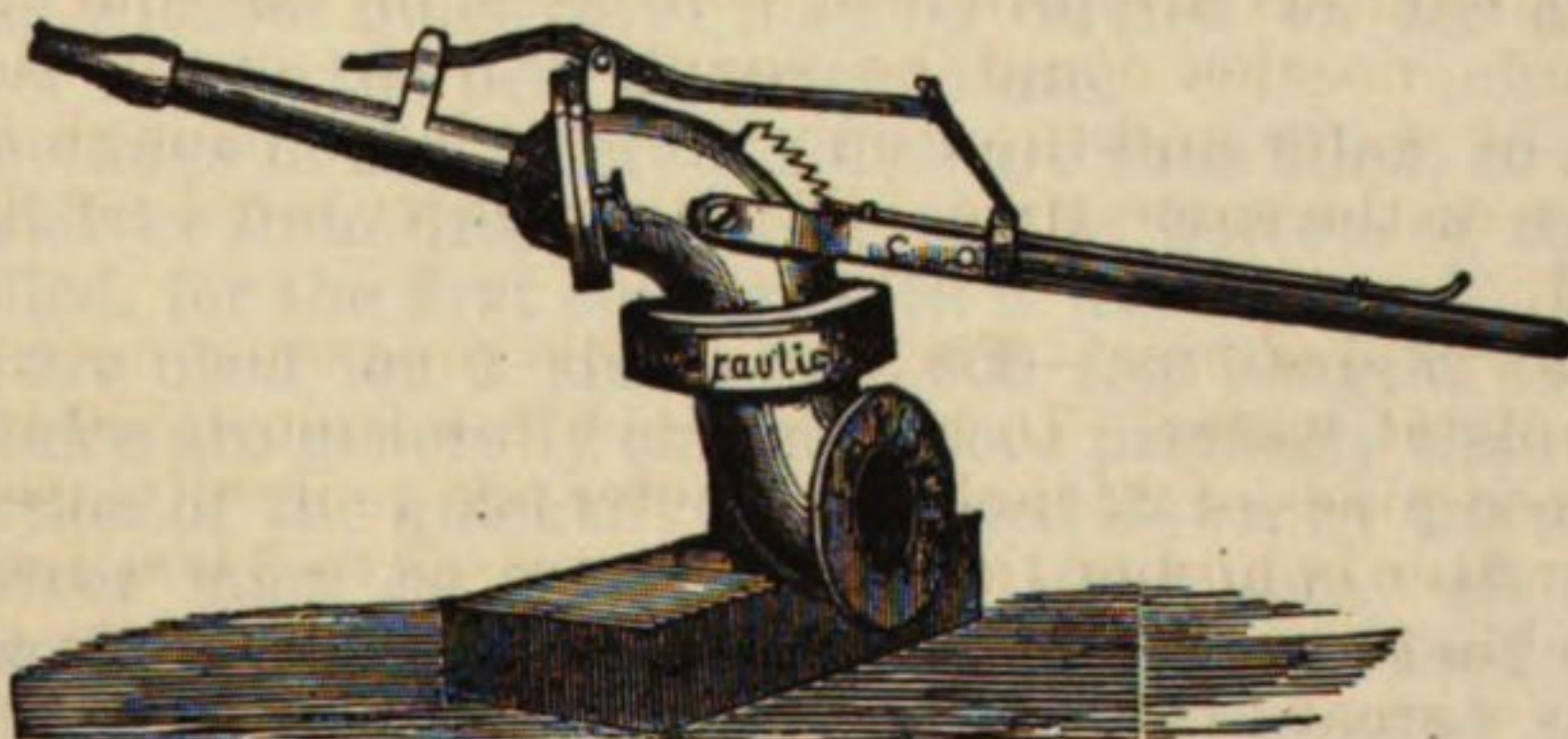


Fig. 24. Fisher's knuckle-joint and nozzle. (See p. 417.)

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These air-valves ought to be provided with brass, *not wooden*, floats, since the swelling of the latter will, under some circumstances, wedge them so tightly in the valve that the atmospheric pressure is unable to remove them; a collapse is the consequence.)

The water at the bulk-head must cover the mouth of the pipe for a depth of 3 or 4 feet, to lessen the amount of air, some of which, under all circumstances, will enter with the water. Where the feed-pipe has a permanent position, it is the best plan to have joints riveted together; that part of the pipe which is liable to be shifted must be connected by hooks and wire, and the joints must be calked carefully. The pipe must be placed in such a position that it is immovable; on precipitous ground, braces and frame-works, weighted down with stones, ought to be used at intervals. An air-pipe must be attached to the feed-pipe at or near its upper end. (See Fig. 18.)

The iron used for these feed-pipes varies from No. 16 to No. 11, and lower, according to the greater or less pressure; however, care should always be taken not only to employ the best charcoal-iron, but also to have it strong enough against all chances.

For a 22-inch pipe No. 16 iron was used for pressure up to 150 feet; No. 14 from 150 to 250 feet; No. 12 from 250 to 310 feet. For a 30-inch pipe No. 14 iron was used for pressure up to 150 feet; No. 12 from 150 to 275 feet.

The pipes supplying the hydraulic nozzle from the distributor will differ in size, say from 10 to 15 inches; must be made of No. 14 or No. 12 iron, and must be connected either by flanges or by hooks and wire; well calked and firmly secured in their position.

All the pipes should be protected by immersion in Dr. Angus Smith's preparation of coal-tar.

THE EXTRACTION OF GOLD.

The use of quicksilver.—Quicksilver is used to collect and combine small particles of gold, in the form of amalgam. To facilitate this action it is necessary to use it in such a way that it may be constantly exposed to a contact with these minute particles of gold. For this reason the washing through the sluice-boxes must commence before any quicksilver is used, so as to get the interstices between the riffles filled with small gravel, sand, clay, &c.

This washing without quicksilver may be carried on for a day, and light top-gravel will be the best material to use.

After the openings in the different riffles are thus filled, so as to prevent the quicksilver from dropping clear to the bottom of the sluices, it may be applied, for the first charge, with a liberal hand. From 500 to 600 pounds are used for a sluice of 5,000 feet length. The upper parts of the sluice are generally charged more profusely than the lower parts, as a portion of the quicksilver is carried down by the stream.

The quicksilver must be scattered in a light spray all along the sluices; iron sprinkling-pots, made for the purpose, are used with good effect. The charging of the sluices is generally attended to twice a day; but it must be admitted that a more liberal and more frequent application of quicksilver would be only beneficial. The daily charges of quicksilver are reduced to about 100 pounds, so that a supply of one hundred flasks of quicksilver (about 74 pounds per flask) will last for a six months' run, allowing for the quicksilver regained by the semi-monthly cleaning up of the upper part of the sluice-boxes.

Cleaning up.—The upper part of the sluice, provided with either

scantling-riffles or block-riffles, is generally cleaned up once or twice per month. Whenever this is resolved upon the sluices are gradually emptied of their gravel contents down to the riffles, and these are removed successively, commencing with the upper riffle.

A small stream of water is applied to move gently the black sand, or fine gravel, which may remain in the sluices. The amalgam or quicksilver is scooped up and put in wooden or iron buckets. Here and there pieces of scantling are placed across the sluice to check the flow of the quicksilver. Brooms, scrapers, and knives are used to collect the amalgam which may hide in small fissures of the wood. A general cleaning up takes place once or twice a year, when the whole line of sluices is deprived of its gold and quicksilver.

The riffles, whatever they may be, are put alongside the sluices, ready to be replaced for new service.

Cleaning the amalgam.—The amalgam must be placed in a quicksilver-bath to separate the gold from any baser metal, particularly lead, which has been scattered by the hundred pounds over the hill-sides of California by quail and rabbit hunters. The amalgam must be well broken up, and rubbed and washed repeatedly. In this way the gold, as the heaviest part, will settle to the bottom, and all the other metallic substances will float on the top of the quicksilver. After this washing the amalgam is deprived of the free quicksilver by straining through a filter of canvas, and afterwards put in a bath of water and sulphuric acid (one-third acid and two-thirds water) and bailed and stirred over a slow fire for about forty minutes. By this process the remaining lead is generally removed, and the amalgam, after further washing in pure water, may be considered clean.

The residue (skimmings) of lead, &c., is put in pure nitric acid, which destroys the lead, forming a nitrate of lead; the amalgam remains, and is cleaned by a water-wash.

Retorting.—After the amalgam has been purified it is ready for retorting. The retort is covered on the inside with a thin layer of moist clay to prevent the gold from sticking to the sides, after which the amalgam is packed tightly into the retort and the latter placed on the fire. A pipe leading from the retort into an iron bucket, filled with clean water, conducts the vaporized quicksilver into the water where a condensation takes place immediately. Five or ten minutes after the flow of quicksilver has stopped, provided the retort has been all the time exposed to a brisk fire, the retort may be removed from the furnace, and the amalgam has been changed into a cone of pure gold.

Great care must be taken to close hermetically the retort containing the amalgam, as the escaping quicksilver-vapors are very poisonous.

Smelting.—The retorted gold is broken in fine pieces, placed in a crucible, and, after some flux is added, exposed in the furnace to a hot charcoal fire. After a perfect fusion has taken place, the liquid gold is cast in a mold, generally the shape of a small brick. After cooling, the bar is stamped with the name of the mining company and the weight, and is ready for the mint or assay office.

LOSS OF GOLD AND QUICKSILVER.

It is difficult to arrive at a correct estimate of the loss of gold in hydraulic washings. In mines where coarse gold predominates the loss cannot be so great as where gold in fine particles, commonly called flour-gold, constitutes the principal yield. Hydraulic mines, however, must

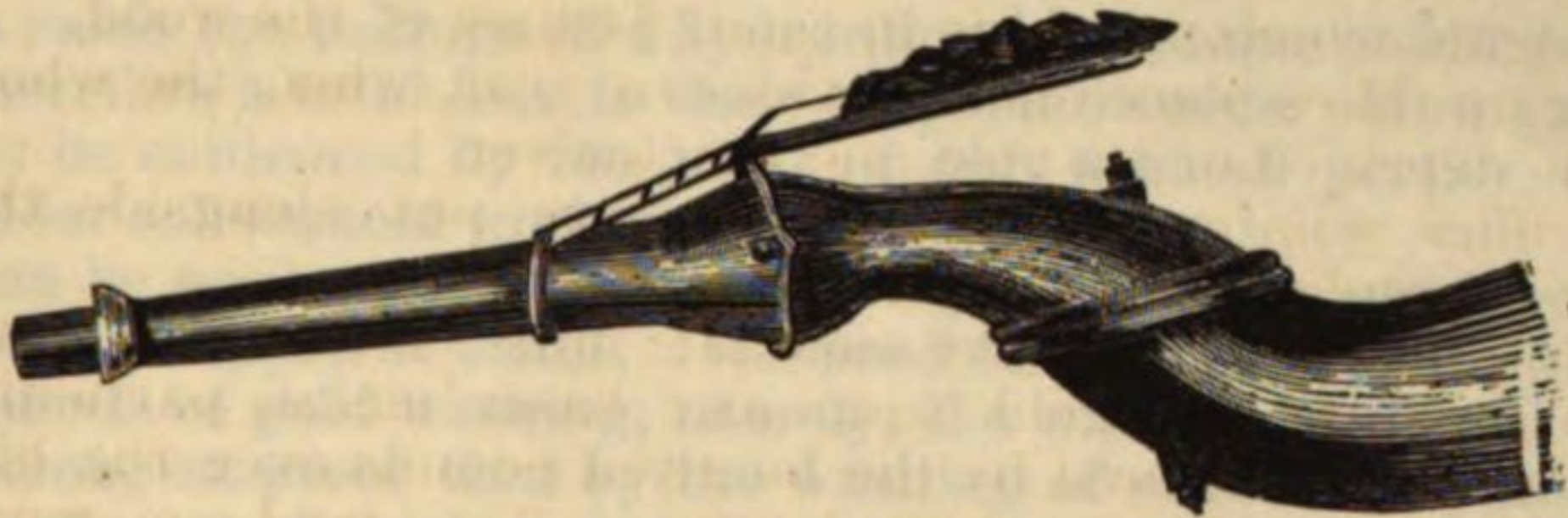


Fig. 25. Hoskin's Little Giant. (See p. 418.)

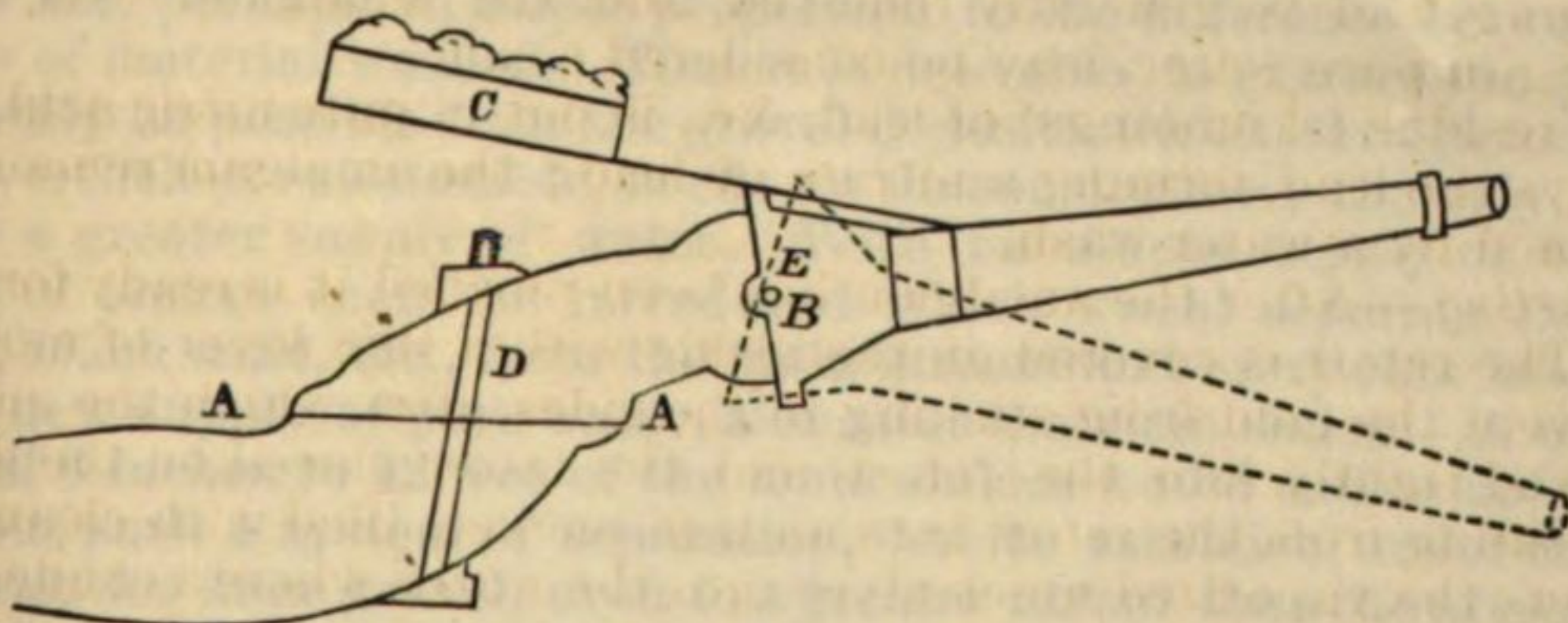


Fig. 26. Little Giant, section. A, joint for horizontal motion; B, ditto for depression or elevation; C, balance-box to keep pipe in place; D, E, bolts. (See p. 418.)

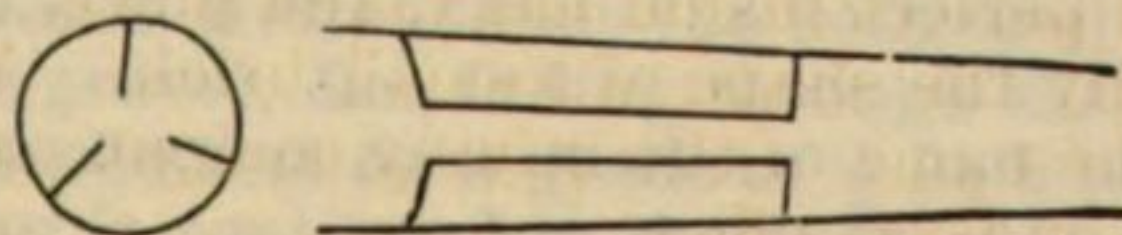


Fig. 26 a. Little Giant, rifle or radial plates. (See p. 418.)

The first of these is the fact that the United States is a young nation, and that its history is a history of growth and development. The second is the fact that the United States is a nation of immigrants, and that its history is a history of the struggle for a common identity. The third is the fact that the United States is a nation of free men, and that its history is a history of the struggle for liberty and justice for all.

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chiefly depend on the latter gold, which is diffused through the hills and mountain-sides.

The loss of quicksilver in the best-conducted hydraulic mines is from $12\frac{1}{2}$ to 15 per cent., and the loss of gold, in many cases, can hardly be less. Even if almost all the heavier particles of bright gold are saved, still there is in all mines a proportion of rusty gold, which is not attacked by quicksilver, and is very liable, on account of the reduction of its specific gravity by the adherence of foreign matter, to be carried off in the sluice-stream.

In most cases the tailings of a hydraulic mine become public property, and are therefore a total loss to their original owners. How great this loss is may be evidenced by the yield of only a small portion of these tailings under subsequent working.

There can be no doubt whatever that generally too much gravel is washed for the supply of water. We need only to argue from the most primitive mode of gold-washing, namely, the washing with the pan, to gain the strongest proof that by the washing of enormous quantities of gravel in a stream of thick and muddy water great quantities of the finer particles of gold are lost. To save such gold in a pan requires not only a skillful hand, but a change of water, so as to offer the least resistance to the settling of the particles at the bottom of the pan. Considering, then, how easy it is to carry on certain mechanical operations on a small scale, which are altogether impracticable on a large one, we must conclude that the difficulties of saving the flour-gold in enormous sluices, running rapid streams of thick and muddy water, must be increased, though not, perhaps, in direct proportion to the difference between the quality of material washed. That it is desirable to extract the gold as completely as possible from the gravel-deposits, which, though immense, are nevertheless exhaustible, needs no demonstration; the only means will be a greater supply of water. With an ample supply of water a system of sluices could be introduced which would separate the finer gravel, black sand, &c., from the main stream and carry this finer stuff, with a new supply of pure water, alongside the main sluice. A medium grade of 6 inches to 12 feet of the main sluices would suffice not only to carry out such a system of separation, but to establish under-currents and drops for finer gravel, even to a greater extent than the present system of sluice-washing permits.

We will suppose that sluice-boxes on a grade of 6 inches per 12 feet and for a distance of 5,000 feet are established; that, furthermore, the natural fall of the main outlet permits no higher grade.

At the point where main sluices leave the tunnel, (the length of which is immaterial,) a grating, such as described under the heading of under-currents, is inserted in the bottom, flush with the pavement of the sluices. The bottom of the main sluice, below this grating, which may be from 15 to 18 inches in width, forms the bottom of the box which receives the water, fine gravel, &c., falling through the grating. To give fall to this box, a false bottom on a grade of $\frac{1}{2}$ inch per foot is inserted. This box leads into (or is continued in the form of) a smaller sluice-box, running alongside the main sluice and on a grade of only 4 inches per 12 feet.

To facilitate the flow of this strained material, and to make up for the loss of grade, a jet of pure water is injected by a small pipe into the receiving-box below the grating, assisting thus in keeping this box clear and in washing the strained gravel, &c., in a pure stream of water.

Figure 28 represents the sluices running on a higher grade than 6

inches to 12 feet, to make the difference in grade which exists between the two sluice-boxes more prominent and perceptible.

A represents the rock pavement in the main sluice-boxes flush with the grating.

B is an iron pipe, large enough to supply streams of pure water in sufficient quantities, when necessary.

C is a smaller pipe, leading a jet of water into the box below the grating.

The small sluices, containing the strained gravel-wash, will gain, in a run of 250 feet, about 3 feet and 6 inches height over the main sluice-boxes, the former running on 4 inches and the latter on 6 inches grade to the 12 feet. At this point—250 feet from the first tap—another grating and small sluice-box is established as before. At the same point the platform of an under-current, 36 feet long and of any desirable width, running on a grade of 12 inches per 12 feet, or 1 inch per foot, can be constructed. This platform connects at its lower end with the second smaller sluice-box, and empties its contents into that box, which needs to be enlarged sufficiently to carry, in a shallow stream, all the gravel and water received. It is supposed that another jet of pure water has been tapped from pipe B, and applied as before mentioned.

It will hardly be necessary to say that all these arrangements should be carried on far enough from the main sluices not to interfere with them except at those places where the tapping takes place.

Fig. 29. A. First tap, running 250 ft. and gaining 3 ft. 6 in. over grade of main sluices.

B. Second tap from main sluices, 3 feet 6 inches lower than the first.

C. Platform of under-current, on 1 inch per foot grade, and 36 feet long.

D. Widened boxes, running on 4 inch per 12 feet grade.

E. Main sluice.

We have here, then, in a distance of 250 feet, and without loss to the grade or elevated position of the main sluices, an under-current of 36 feet length and 1 inch per foot grade; and we can repeat the arrangement for every similar distance, and without losing control of the strained gravel, &c., which is carried onward independent of the mass of material in the main sluices.

The finer gravel, which is gradually extracted from the main sluices, must be collected into one box, increased in size as new tributaries empty into it. Considering that only very fine gravel, with an increased supply of water, is carried by these boxes, they may be made very wide, so as to permit the gravel and sand to spread and run in a thin stream.

To regulate the overflow, triangular checks, as represented in the platform C in the last sketch, may be used, one of the angles turned toward the stream.

If a drop is preferred, from time to time, instead of an under-current, or its platform, a very strong and tight box should be placed below, and a few feet lower than the actual drop.

To the bottom of this box a strong iron pipe, 1 or 2 inches in diameter, may be adjusted, being, at the same time, connected with the supply-pipe which furnishes the water along the line of sluices.

This water is supposed to be subject to any desirable pressure and might be used at these drop-boxes under enough pressure to keep the quicksilver and other matter in the drop-box in perpetual motion, and thus assist in the liberation and amalgamation of the gold.

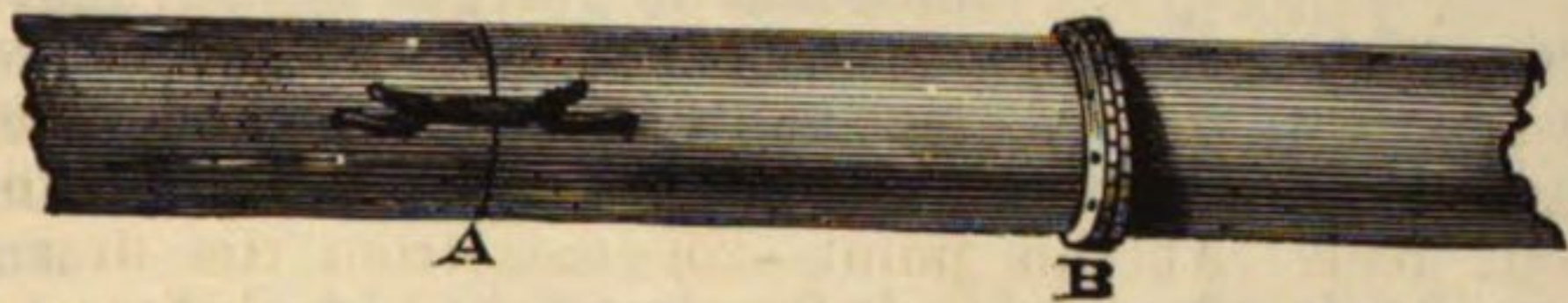


Fig. 27. A, hook and wire connection ; B, flanges. (See p. 419.)

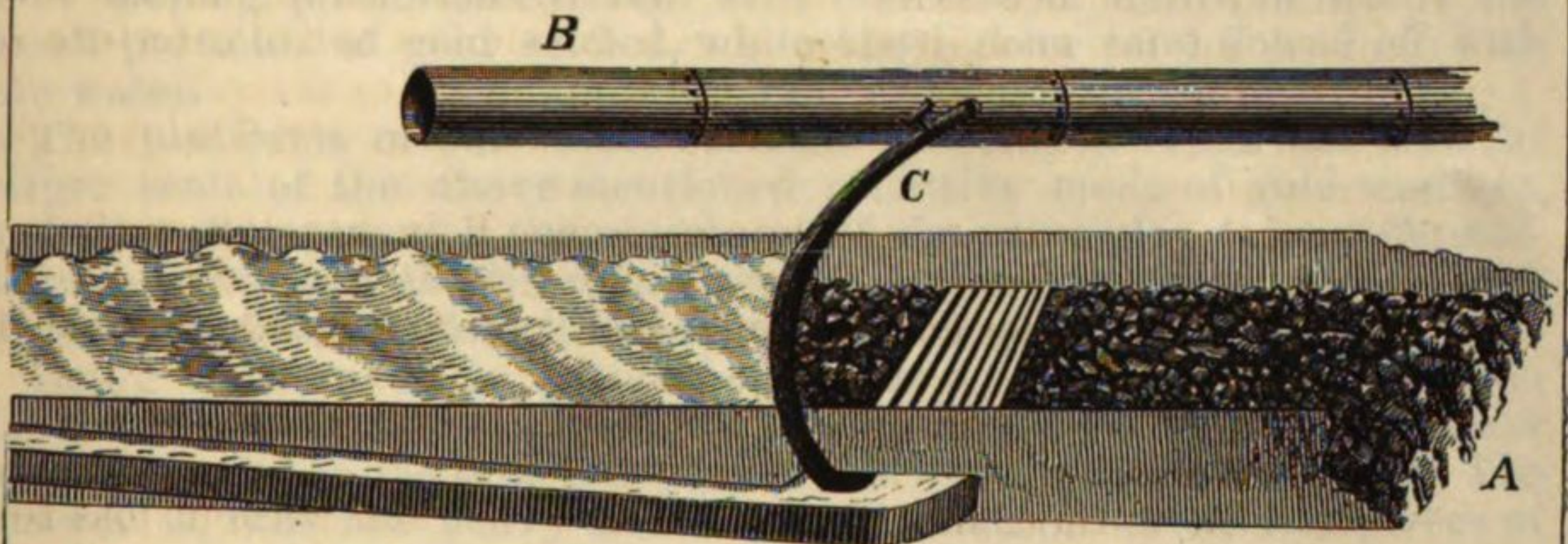


Fig. 28. Main and auxiliary sluice-boxes. A, rock-pavement ; B, large iron pipe ; C, small pipe. (See pp. 421, 422.)

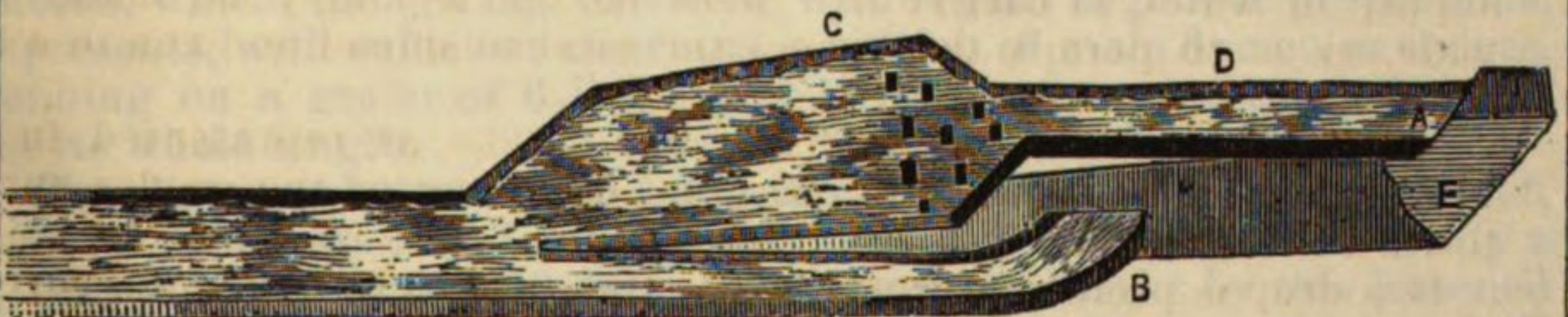


Fig. 29. Arrangement of undercurrent, (perspective distorted to show details.) A, first tap ; B, second tap ; C, platform of undercurrent ; D, widened boxes ; E, main sluice. (See p. 422.)

A further sifting or reduction in size of the gravel can be accomplished by straining it through a grating with $\frac{1}{2}$ inch interstices between the bars; the refuse matter may either be thrown at once into the main sluices, or, in case an abundance of water is at hand, carried in a separate box to the place of general deposit. Should the refuse pebbles be thrown back into the main sluice all future gratings in the latter must be fine enough to retain these refuse pebbles in the main sluices, and thus to prevent useless shifting of material.

The water which the main sluice loses by the repeated tapping must be supplied by pure water from the supply-pipe. The size of the main flume or sluice must also be reduced as the water stream and solid material lessens.

It would be advisable to supply all the sluices for the finer or sifted gravel with riffles made of 2 by 3 inch scantlings, which are not only considered the best gold-catchers, but are easily removed and replaced, and durable enough for the washing of fine gravel.

In the history of gold-mining the *washing process* can claim priority over all others, no matter whether the gold was found in the sands of a river or in a solid ledge of quartz. If in the latter, the solid quartz was first reduced to sand, and then treated like river-sand by washing over sloping platforms covered with blankets or skins, in which the small particles of gold settled, while the lighter sand flowed off with the water.

The platforms of our under-currents are only a repetition on a far larger scale of the above-mentioned primitive mode of gold-washing, and they illustrate well the soundness of the principle: *to pour the gold-bearing matter in a shallow stream over an inclined platform, provided with a rough surface, on which the small particles of gold can be caught.*

Being then forced to acknowledge that a broad and shallow stream facilitates the catching of gold, we must ask, *why are all our sluice-boxes not constructed on the principle of under-currents, wide and shallow?* The answer is, that the heavy and large material, (boulders and pieces of hard clay or cement,) needs a deep current of water to carry it along.

If, therefore, a separation of the finer gravel from these boulders, &c., were effected, no reasonable obstacle would remain to the application of that principle in gold-washing which has been sanctioned by the practice of thousands of years, and which our modern time, with all its advances in science, cannot improve, but only imitate.

The practicability of such an application in gold-washing, even for the largest hydraulic operations, may be illustrated by the subjoined sketch, which, though not executed with regard to proper proportions, represents, with sufficient clearness, a section of main flumes, or sluices, running on a grade of 6 inches per 12 feet, and tapped every 250 feet for its whole length.

The distance between tap I and tap II would, therefore, be 250 feet, and between tap I and tap III 500 feet. The platforms have only a grade of 4 inches per 12 feet, and the gain in height by this lessened grade would be for a distance of 250 feet about $3\frac{1}{2}$ feet, which gain is spent in a drop at tap II, where a larger platform receives the strained gravels of taps I and II. Where the gravel and water drop off is inserted a deep, strong box, well charged with quicksilver. To the bottom of this box an iron pipe is led, which discharges a stream of water under a regulated hydrostatic pressure and in adjustable quantities.

In this way the quicksilver would be kept always in motion, and the gravel itself would be subjected to an excellent crushing process. (See sketch, pipe 1.) Pipes 2 and 3 inject streams of pure water under the

grating to keep the box clear, and to supply also more water to wash the gravel over the widened platforms.

This process may be repeated for the whole length of the sluice-boxes. The size of the gravel may be reduced by repeated straining, as described above.

The undeniable advantages of this mode of working can be stated in a few words:

First. All the fine gravel and sand, in which most of the fine or rusty gold is carried off, will be submitted to a continuous washing over under-current platforms, without ever being returned to the main sluices. The reduced grade on these platforms is equalized by an addition of pure water, which will permit an easier settling of the gold than a swift and muddy stream.

Secondly. Repeated drops, connected with a strong hydraulic jet, will do a great deal for the scouring of rusty gold, and the general breaking up of the washed material.

Thirdly. A reduction of the gravel to the smallest size can be easily attained by repeated straining, as mentioned before, so that the largest pebble would only equal a pea in size.

To prevent this fine-gravel wash from "baking," requires only a very simple arrangement. A frame-work, resembling a common harrow, can be placed on the top of the platform, the teeth downward, and touching with their points the riffles of the platform. This arrangement would secure the breaking of the stream at a hundred or more points, and could be removed and replaced at a moment's warning. (See Fig. 30.)

Where motive power can be procured as easily as on large sluice-boxes running a large and rapid stream of water, this harrow might be put in slow motion by an undershot-wheel, the frame of the harrow running on rollers upon the sides of the platform.

This sort of machinery is the simplest in construction, and could be used, perhaps, with great beneficial effect, and without that wear and tear which any more complicated machinery would suffer by the treatment of such an enormous quantity of material as continually passes over the long line of platforms.

The writer submits the foregoing suggestions, trusting not only to gain the favorable judgment, but also to arouse the inventive energy of those to whom we owe already the present advanced condition of the art of hydraulic mining.

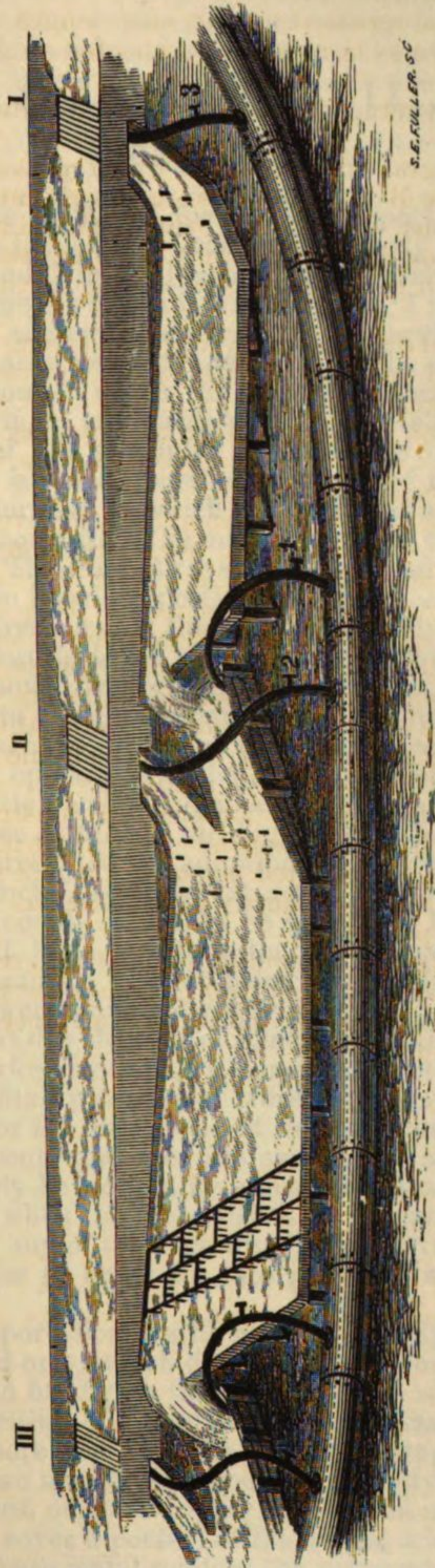
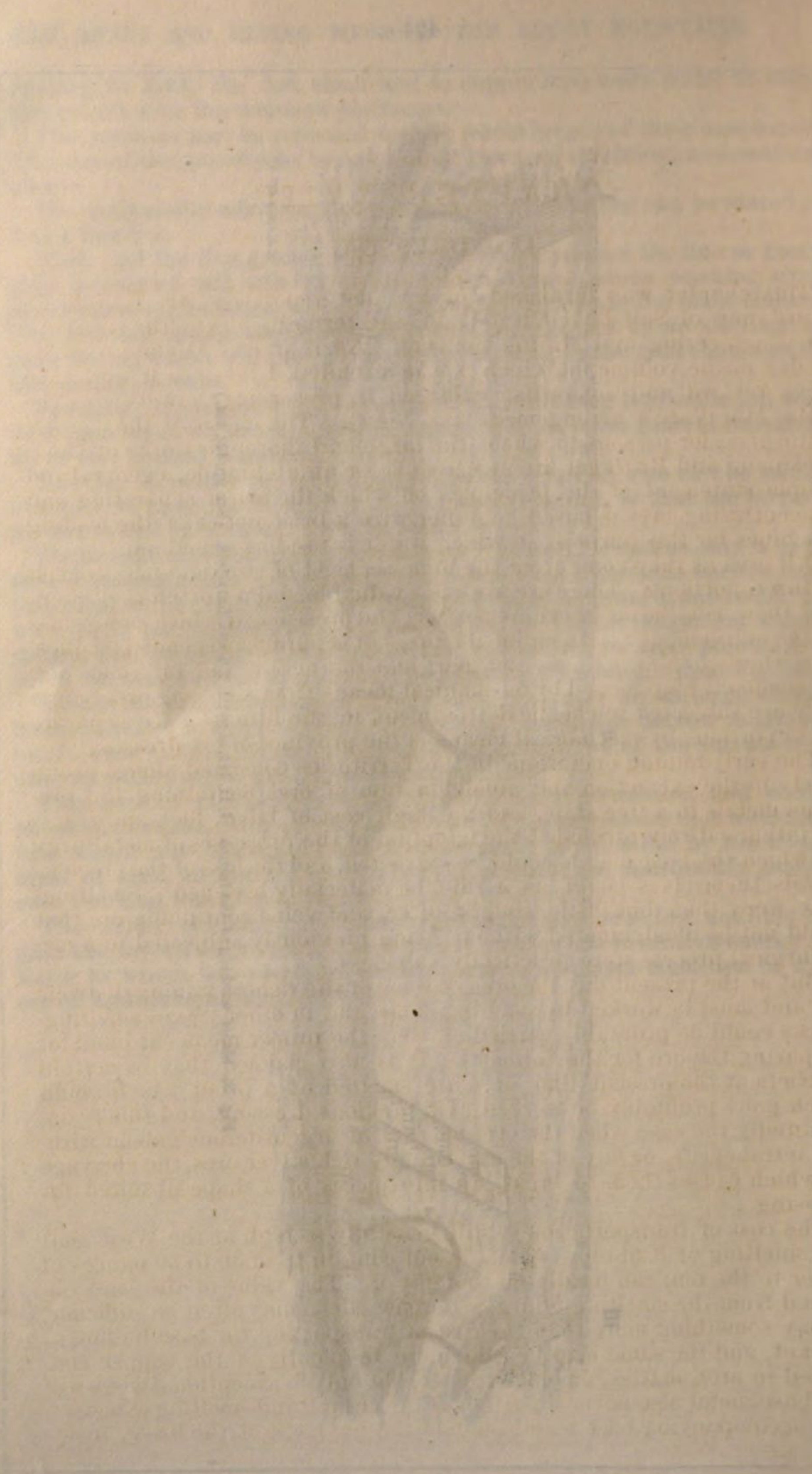


Fig. 30. Sluice-washing of the future. I, II, III, taps; 1, 2, 3, auxiliary jets. (See pp. 423, 424.)



CHAPTER XVIII.

ORE-DRESSING.

This chapter was furnished for my last report by Mr. Willard P. Ward, now of Salt Lake City, Utah, and formerly one of the editors of the Engineering and Mining Journal. As it arrived too late to be included in the volume for which it was intended, I retained it, and have since revised and somewhat enlarged it, preserving, however, in the main, Mr. Ward's arrangement and views. The object of the chapter is to give, for persons to whom the large and thorough works of Gaet-zockmaun and Rittinger are inaccessible or unintelligible, a general and simple statement of the principles on which the art of separating and concentrating ores is based, together with a brief notice of the leading machines for this purpose, in which water is used as a medium.

All ores as they come from the mines consist of two, and may consist of three, portions. There are always a valuable and a worthless portion, and there may be an injurious portion, the presence of which causes loss in the subsequent treatment of the ore. It is purely an economical question whether the worthless and inert and the active and injurious portions should be removed by mechanical means from smelting-ores before they are subjected to chemical treatment in the furnace. To separate these portions by mechanical means is the province of ore-dressing.

The early mining operations in the Territories consisted almost exclusively in the extraction and amalgamation of ores containing the precious metals in a free state, and the high cost of labor, fuel, and transportation entirely precluded the adoption of the processes of metallurgy by which the base metals could be extracted, and the loss of the precious metals themselves could, as a rule, be materially lessened. Smelting-ores were then but little sought after, and veins containing ore that could not be amalgamated without being previously subjected to a metallurgical process were practically valueless.

But at the present day the ores of some of the richest mining districts are and must be worked by smelting alone, and in other places smelting-works could be profitably carried on were the proper means at hand for preparing the ore for the furnaces. It is also claimed that in certain districts at the present time ores are smelted at a profit which could much more profitably be worked by a previous dressing, and this is undoubtedly the case when the ore consists of argentiferous galena without tetrahedrite, or any of the exceedingly rich silver-ores, the cleavage of which causes them to break up into pieces of a shape ill-suited for dressing.

The cost of transportation is still generally so high at the West that the smelting of lead-ores, which do not contain from 30 to 50 ounces of silver to the ton, can hardly be thought of. The value of the lead obtained from the smelting of argentiferous galena may often be sufficient to pay something more than the cost of transporting the base bullion to market, and the same may be said more frequently of the copper contained in ores, mattes, or black-copper, but only in exceptional cases will the base metal also cover a portion of the mining and smelting expenses. The accompanying base metal renders the payment of the heavy insur-

ance rates on fine bullion unnecessary, and the saving thus effected will go far towards paying the freight on the base metals.

Dressing-works are properly adjuncts to smelting-works and *vice versa*. In some localities silver-ores are found of sufficient richness to be smelted without previous preparation, but instances in which a proper dressing would not be advantageous are rare. Even in rich ores there is usually much more earthy matter than is necessary for the formation of sufficient slag to protect the metal in the furnace, and the removal of this excess by dressing before the ore comes to the furnace would always be found economical.

For example, the ores generally smelted in Utah contain a very much larger percentage of silica than can be used in slagging the oxide of iron and the alkaline bases which they contain, and in order to work these ores, fluxes, consisting of iron-stone or limestone, or a mixture of the two, must be employed in the furnace. The removal of a portion of the silica by mechanical dressing would save not only the cost of the fluxes, but the expense of smelting a much larger quantity of slag than is required.

It is claimed by some that decomposed ores, such as the carbonates of lead found in the Emma, Miller, and many other leading mines near Salt Lake, might also be dressed to advantage. This would entail the loss of almost all of the oxide of iron which they contain, but proportionally much more silica could be removed.

Another, and a not less important function of dressing, is the removal of substances which act injuriously in the smelting process, causing irregularity in the working of the furnace, and loss, by volatilization or otherwise, of both base and precious metals. In this respect we see the difference between a true dressing of an ore and a simple concentration, which aims merely at removing a portion of the worthless gangue, and which divides the ore from the mines into but two portions, headings and tailings. By means of a rational and comprehensive system of dressing, however, the galena, the pyrites, and the blende, which may have been intimately associated in the ore as it came from the mine, may be separated cleanly enough for all practical purposes, and each subsequently treated for itself. The advantage of making a complete separation of this kind will be apparent when we consider that the blende, which is so commonly associated with silver-bearing galena, is often poor in silver, and when put in the lead furnace not only consumes a considerable quantity of heat in being volatilized or smelted into the slag, but carries with it up the chimney or into the slag a much greater amount of silver than was contained in it when it was put in the furnace. If, however, this zinc-blende can, with only a small percentage of galena, be treated by itself, it can be used for the preparation of zinc-white, (Bartlett's process,) and a large proportion of its contents of silver saved, or by different treatment metallic zinc may be made from it.

It is apparent, however, that the loss arising from the presence of zinc in the lead furnace, added to the value of the zinc and silver which may be saved, might not always be sufficient to pay the cost of dressing the ore, and as the question is purely an economical one, it will be necessary for every one working such an ore to decide in his individual case as to whether dressing would be pecuniarily advantageous to him or not. In deciding this question the best method of separation must be first determined, and the cost of dressing the ore by that process ascertained; then the loss of silver in the furnace caused by the volatilization of the zinc must be estimated with all possible care from assays and from comparison with other cases in which similar ores have been

smelted with and without previous dressing. Hence it will be seen that the question is by no means a simple one after all. Technical knowledge, experience, and sound business judgment are necessary for its proper solution, and all that can reasonably be expected from a dissertation on the subject of ore-dressing is that the cheapest and most approved methods of dressing shall be given, together with descriptions and illustrations of machinery which have not appeared in previous reports of the Commissioner, and as far as possible the data from which the cost of constructing and operating such machines may be reckoned with tolerable accuracy in different districts and under different circumstances. It is evidently impracticable to give, in the limits of the present chapter, either the exact cost of dressing in any particular case or the metallurgical losses which are caused by the presence of the injurious substance. The aid of skilled metallurgists should be called to solve the question, which is both too complicated and too important to be decided by any one else.

From what precedes it is clear that, before we reach the final product of the mining and smelting operations, the metal itself, the earthy portions of the ore must be got rid of. The economical question is, whether it is cheaper to wash away a considerable portion of this dead mass, or to put it in the furnace and smelt it up along with the productive portion. Any *concentration* will remove a portion of the unproductive part, and no economical system will perfectly separate every trace of it. We are compelled, therefore, to resort to a partial separation, if we resort to any, and the question, how far it will pay to go, becomes the important one. It would not usually be desirable to separate every trace of gangue from the ore, even if we could. What is left in the ore forms a slag which protects the metal in the hearth of the furnace from the oxidizing influences of the blast; and, were no earthy material present in the ore, it would be necessary to add some for the purpose alluded to. If the ore is to be transported for great distances, the cost of transporting worthless material should be taken into account; but, under other circumstances, it is not desirable to pass a certain limit in the concentration, which must be determined, as before, by actual study and experiment.

It will be noticed that no allusion has been made to the dressing of ores which are to be merely amalgamated, or roasted and amalgamated. When amalgamation alone is employed, previous concentration would be worse than useless, and, even when the ore is to be roasted and amalgamated, the loss in concentration would generally be greater than the cost of passing the inert matter through the roasting-furnace. In the present chapter, therefore, only smelting-ores are regarded as proper subjects for dressing. Tailings from amalgamation, from which the pyrites or other minerals are to be dressed out, are here classed under the denomination of smelting-ores, though in reality they are often treated by chlorination, or by a peculiar amalgamation, including the use of chemicals.

The theory of separation.—The most favorable possible conditions under which ore could be dressed would be to have the valuable portion of the ore possessed of a specific gravity greater than the liquid in which the dressing is to be performed, and the worthless portion of a specific gravity less than that of the liquid. For example, let us suppose an ore consisting of galena, the specific gravity of which is 7.5, and quartz of the specific gravity 2.5, so finely crushed that each particle consisted of one of the minerals alone, to be located first in a liquid of a specific gravity 5. It is evident that the quartz would remain

floating on the surface, while the galena would be found at the bottom of the vessel containing the liquid. Practically, however, it would be found that pieces consisting partly of galena and partly of quartz, and whose specific gravity was less than that of the liquid, would remain floating, because it would be practically impossible to separate the minerals entirely by crushing, and fulfill one condition of our problem. It is evident, therefore, that if, even in the most favorable condition we can possibly imagine, the mechanical mixture of the ore is such that we can never divide it into pieces consisting entirely of one mineral, we cannot hope, by the ordinary appliances for dressing ore, to be able to achieve perfect results. Worthless and valuable minerals can never be entirely separated when they occur mixed together in an ore.

We may, however, by passing an ore once through a single machine, obtain one portion which shall contain, practically, none of the accompanying gangue, but we must do it at the loss of a considerable portion of valuable material; or we may obtain a portion which shall, to all intents and purposes, be free from the valuable constituent of the ore, but this can only be done by leaving a considerable portion of worthless material mixed with the valuable portion. It is not more difficult to make the separation in one way than in the other, but the question of economy must be again considered in determining which of the two limits we will most nearly approach. When the ore is very valuable for the precious metal it contains, and at the same time consists mainly of gangue, it would probably be found advantageous to remove only so much of the worthless portion as could be separated with but very slight loss of the valuable mineral. On the contrary, when the cost of smelting was high as compared with the value of the ore, it would be economical to carry the removal of the worthless part much further, though, for reasons given above, it would probably never be found economical to go to the limit of removing all the gangue.

The question of an economical concentration where the ore is to be separated into only two portions is much less complicated than that of dressing an ore composed of several minerals, which it is desirable to separate as cleanly as possible.

Ore cannot be dressed except in some medium which offers a resistance to the force of gravity. An old and familiar physical experiment consists in placing a feather and a piece of lead in a long, thick glass tube provided with a stop-cock at each end. If the tube is held vertically, and suddenly turned upside down when it is full of air, the difference in the times required for the lead and the feather to reach the bottom is very perceptible; but if the air is exhausted by means of an air-pump, the difference in the times will be so slight as to be imperceptible, notwithstanding that some air is always left in the tube, showing that a separation of bodies according to their specific gravity in a vacuum would be impossible.

Water and air are the most convenient and the cheapest media in which the separation of ores can be made, and both of them have been employed for the purpose.

The specific gravity of water, however, approaches more nearly to a mean between the specific gravities of ore and the accompanying gangue, and offers much more resistance to the action of gravity, and for these reasons it has generally been preferred to air, except for the dressing of certain ores. The use of water as a medium is so much more common, that I shall consider wet dressing first, and then take up the discussion of the dry method. I shall make use of many principles and formulæ

developed in the excellent German works of Rittinger and Gaetzschmann.

Since all ore-dressing is founded on the different behavior of substances of different specific gravities, the study of the action of the laws of gravity will not be out of place here.

If a mixture of particles of different sizes and different specific gravities were allowed to fall a certain distance through water, (supposing all the particles to start together,) they would form a deposit on the bottom of the vessel, separate horizontal layers of which would consist of particles which reached the bottom at about the same time. It is evident that the undermost layer would consist of coarse and very dense particles, together with coarser particles of less specific gravity. The uppermost layer would consist of the finest particles of the densest substances, with larger particles of the less dense substances. If each layer is separately removed, the different sized particles can be easily separated by sieves of different sized meshes into parcels of the same, or nearly the same, specific gravity. The smallest grains will, of course, be the densest, and the largest the least dense in each layer.

If, however, the separation of the grains according to size be undertaken previously, and only sized material be thrown into the water, the layers of the deposit at the bottom will be composed of particles of the same specific gravity. It is important, therefore, that the laws which govern the falling in water of bodies of different sizes and densities should be well understood, for upon them is founded the practice of wet dressing of ores.

It has been already remarked that the action of the water is to afford a resistance to the operation of the force of gravity, and to cause bodies heavier than water to fall more slowly through it than they would through a vacuum, or through air.

This effect may be augmented by placing the bodies in a column of water which is in motion upward. The fall of a body would then be opposed by a force arising from the positive motion of the water in the contrary direction, which must be added to the resistance due to the density of the water, in order to find the total resistance to gravity.

Before proceeding to show how this resistance may be calculated, let me briefly demonstrate some of the principles governing the free fall of bodies through a vacuum and through air. The motion acquired by a falling body is of the kind known in mechanics as *uniformly varied motion*, in distinction from *uniform motion*.

Uniform motion is that in which the moving point describes equal spaces in equal portions of time. If we denote the space passed over in one second by v , and in t seconds by s , we have from the definition—

$$s = vt; \therefore v = \frac{s}{t}$$

From the first of these equations we see that the space described in any time is equal to the product of the velocity and time; and from the second that the velocity is equal to the space described in any time divided by that time.

Uniformly varied motion is that in which the velocity increases or diminishes uniformly. In the former case, the motion is accelerated, and in the latter retarded. In both the moving force is constant.

To find the relation between the spaces passed over and the velocities generated in any time, let the acceleration due to the moving force be denoted by p , and the velocity generated in t seconds by v . The accel-

eration is the velocity generated in one second, and since the velocity is proportional to the time, we have, from the definition—

$$v = p t \dots \dots \dots (1)$$

Since the velocity increases uniformly, the distance traveled in any time is the same as though the body had moved uniformly during that time, with its mean or average velocity. At the beginning of the time t the velocity is zero; at the end of the time it is $p t$; hence the average velocity during the time t is $\frac{1}{2} p t$: multiplying this by the time t we have for the distance traversed $\frac{1}{2} p t \times t$; or denoting the distance by s ,

$$s = \frac{1}{2} p t^2 \dots \dots \dots (2)$$

Equations (1) and (2) express the conditions of motion of a body moving from a state of rest under the action of a constant force. From the former we see that *the velocities are proportional to the times*; and from the latter that *the spaces are proportional to the squares of the times*.

If in equation (2) we make t equal to 1, we find—

$$s = \frac{1}{2} p; \text{ or } p = 2 s$$

That is, if a body moves from rest, under the action of a constant force, the acceleration is measured by twice the space passed over in the first second.

The force of gravity is directed toward the center of the earth, and its intensity varies as the square of the distance from the center. If we denote the acceleration due to gravity by g , and the space fallen through by h , both being regarded as positive downward, we have from equations (1) and (2)—

$$v = g t \dots \dots \dots (3)$$

$$h = \frac{1}{2} g t^2 \dots \dots \dots (4)$$

That is, the velocities are proportional to the times, and the spaces to the squares of the times.

The value of g in the latitude of New York is about $32\frac{1}{8}$ feet, or 9,809 meters, and by substituting this value in equations (3) and (4) and giving to t the values 1, 2, 3, &c., we can easily form a table showing the velocity acquired by a falling body, and the spaces described at the end of 1, 2, 3, &c., seconds.

Solving equation (4) with respect to t , we have—

$$t = \sqrt{\frac{2 h}{g}} \dots \dots \dots (5)$$

That is, the number of seconds required for a body to fall through a given height is equal to the square root of the quotient obtained by dividing twice the height in feet by $32\frac{1}{8}$.

Substituting the value of t in equation (3) we find—

$$v = g \sqrt{\frac{2 h}{g}} \text{ or } v^2 = 2 g h$$

whence, by solving with respect to v and h ,

$$v = \sqrt{2 g h} \text{ and } h = \frac{v^2}{2 g} \dots \dots \dots (6)$$

In these equations v is called the velocity due to the height h , and h the height due to the velocity v .

A column of water rising with a velocity v exerts upon a flat, hori-

zontal plate placed in its current a force which is equal to the weight of a column of water with a base equal to the surface of the plate presented to the action of the stream, and of the height $\frac{v^2}{2g}$; the height due to the velocity. If we designate the surface of the plate opposed to the action of the current by f , we shall have for the vertical force the expression

$$W = f \frac{v^2}{2g} \gamma$$

in which γ represents the weight of a cubic meter of water, (1,000 kilograms,) and g the acceleration due to gravity, from which we have—

$$W = 51 f v^2 \dots\dots\dots (7)$$

The pressure, therefore, increases in direct proportion to the opposed surface, f , and the square of the velocity, v , of the ascending water column.

If the surface f presented to the action of the stream is equal to one square meter, the pressure will be

$$W = 51 v^2 \text{ kilograms} \dots\dots (8)$$

and if the velocity of the water column is one meter per second the pressure will be

$$a = 51 \text{ kilograms} \dots\dots (9)$$

and we may hereafter designate by a the force exerted against the surface of a square meter by a column of water moving with the velocity of one meter per second.

We obtain, therefore, by substituting a for its equivalent in equation (8)

$$w = a v^2 \dots\dots\dots (10)$$

and in equation (7)

$$W = a f v^2 \dots\dots\dots (11)$$

I have already spoken of the fact that larger bodies of less specific gravity fall in water with smaller bodies of greater specific gravity. Of course the actual weight of two such bodies will not be equal. The only condition which must be fulfilled is that the proportion between the actual weight and the surface opposed to the action of the stream shall be the same in each case.

If we suppose the bodies to be spherical, it is easy to demonstrate mathematically, that while the surfaces would vary as the squares of the radii, the contents would vary as the cubes of the radii. As the size of the sphere increases, its cubic contents, and hence its weight, would increase more rapidly than the surface. If we take, for example, a sphere of galena and a sphere of quartz which would fall through a column of water in equal times, we find that the quartz sphere must be more than twenty-three times as heavy as the galena sphere, and the volumes of the spheres must differ still more, that of the quartz being sixty-eight times that of the galena sphere. If we represent the volumes of two equal-falling spheres of galena and quartz by V and V^1 , their diameters by d and d^1 , and their densities by I and I^1 we shall have—

$$\begin{aligned} (\text{galena}) I &= 7.5 \\ (\text{quartz}) I^1 &= 2.6 \end{aligned}$$

And if the bodies are to fall through water the density of which is unity, it is evident that if we subtract unity from I and I^1 , and cube the re-

mainders, we shall have the corresponding values of V^1 and V , and hence we may write—

$$\begin{aligned} V^1 &= 6.5^3 = 275 \\ \text{and } V &= 1.6^3 = 4 \\ V : V^1 &:: 1 : 68 \end{aligned}$$

If we designate the absolute weights of the spheres by P and P^1 we shall have—

$$P : P^1 :: IV : I^1 V^1$$

Substituting for V and V^1 , and I and I^1 , the values already found, we have—

$$P : P^1 :: (7.5 \times 4) : (275 \times 2.6) \text{ or } 30 : 715 \text{ or } 1 : 23.8.$$

In order to find the relation between volumes and weights of equal-falling bodies in air, the density of which is so small (0.00125) that it may be practically neglected, we need only to make—

$$\begin{aligned} V &= 2.6^3 = 17.5 \text{ and} \\ V^1 &= 7.5^3 = 421.8 \end{aligned}$$

Substituting these values in the proportion

$$P : P^1 :: I V : I^1 V^1$$

we shall have the absolute weights of equal-falling spheres of galena and quartz—

$$P : P^1 :: (7.5 \times 17.5) : (2.6 \times 421.8) \text{ or } 131 : 1096.6 \text{ or } 1 : 8.37$$

The volumes will vary in this instance as—

$$(2.6)^3 : (7.5)^3 \text{ or } 17.5 : 421.8 \text{ or } 1 : 24$$

From a comparison of the ratios between the volumes and absolute weights of equal-falling spheres of galena and quartz in water and in air, it will be seen that in order to do good work with any machine, for either wet or dry concentration, a previous accurate sizing of the stuff to be treated is necessary. More particularly is this the case in the dry process, for the difference in the size of equal-falling bodies of different densities in air is much less than in water. A quartz sphere must be four times as large in diameter, contain sixty-eight times the volume, and weigh twenty-three times as much as a galena sphere that behaves in similar manner in falling through a column of water; but in air the quartz sphere would only have to be two and eight-tenths times as large in diameter, contain twenty-four times the volume, and weigh eight and thirty-seven hundredths times as much. In either case, however, the importance of a careful sizing is at once apparent.

Much less importance has been attached, in this country, to the sizing operation than the facts of the case warrant. If we had a pulverized ore, the particles of which were exclusively composed of either galena or quartz, and all of the same size and shape, the separation of the minerals would not be difficult. In practice, however, these conditions are probably never fulfilled. The finely-divided ore will contain particles composed partly of quartz and partly of galena, and as the proportions of the two minerals will vary very greatly in the numerous compound particles, we shall have in effect grains of all specific gravities between galena and quartz, so that no matter if the particles were all of equal size and similar in shape, the absolute separation of the minerals would be impracticable. But it is, moreover, practically impossible to obtain grains of galena and quartz of the same shape. Galena has a distinct cleavage along cubic faces, and naturally breaks up into more or less perfect cubes. Quartz, on the other hand, breaks up into pieces of all possible shapes, but mainly into those of triangular

section in at least one direction. Hence it is evident that a perfect sizing process is an impossibility, though it is none the less important on that account that some such process should be employed, where the best possible work is required. Though it cannot accomplish everything, it is nevertheless an important auxiliary in ore-dressing, which can only be omitted with a loss of valuable material or the retention of more worthless material than should be put into the furnace.

If we imagine a body hung by means of a thread in an ascending column of water, it is apparent that the force exerted by the motion of the water operates against the force of gravity, and lessens the tension of the thread. If the column of water moves with exactly the proper velocity, it is evident that the force exerted may be such as to exactly counterbalance the force of gravity, and cause the body to float without exerting any strain upon the thread. This velocity will depend upon the size and density of the body. The following table gives the velocity of the stream required to keep spherical bodies of different sizes and densities in the condition described :

Substance.	Specific gravity.	Diameter in millimeters.							
		10	8	6	4	3	2	1	$\frac{1}{2}$
		Velocity in meters per second.							
	15.	1.93	1.72	1.50	1.22	1.05	0.86	0.61	0.32
Galena	7.5	1.31	1.17	1.02	0.83	0.72	0.59	0.41	0.29
Iron pyrites	5.	1.03	0.92	0.79	0.65	0.56	0.46	0.32	0.23
Quartz	2.6	0.63	0.56	0.49	0.40	0.35	0.24	0.20	0.14
Coal	1.3	0.28	0.25	0.22	0.17	0.15	0.12	0.08	0.06

A class of machines known as jigs or jiggers operate upon the principle above described. They will be discussed hereafter.

The action of a stream of water passing over an inclined plane upon solid particles forms the basis upon which a number of dressing-machines have been constructed.

It is evident that two forces act at the same time upon a body thus constituted: first the force of gravity, and, secondly, a force due to the current of water. If the inclination of the plane is not too great, the friction of the body against the plane will retard the motion imparted to the body by the current.

The particles may either roll on the plane or they may slide along over its surface. In the former case the retardation of the particle would be due to rolling friction, and in the latter case to sliding friction. The kind of motion depends upon the shape of the particles and the thickness of the stream of water. Round particles, and those nearly approaching that shape, would naturally roll, while flat, or nearly flat particles, would slide. When the particles are very small, and the stream of water is very thin, the friction of the water on the plane is proportionally so great that the lower portion of the stream will have a much slower motion than the upper. Hence, if equal falling particles of different specific gravities and of a proper size are treated on such a plane, the larger particles will be affected much more by the current than the smaller ones, and in this way a separation will be effected according to the size of the particles.

Among the machines in which ore is separated by means of a thin stream of water passing over an inclined surface, I may mention the buddle, the plane-table, and the rotary table. In the percussion-table this principle is also employed.

If grains of different sizes and specific gravities be thrown into a round vessel containing water, in rapid rotation, which is kept up for some little time after their introduction and then allowed to come to rest, the heaviest particles will be found near to the circumference, the lightest near the center, and those of intermediate weight in intermediate positions. In other words, the grains will be separated into concentric rings of equal-falling particles.

Jigs.—The foregoing discussion of the fundamental principles of ore-dressing will be sufficient for the comprehension of the chief machines now used for the purpose. Before treatment by the machines now to be described, a careful sizing of the stuff is, as I have said, necessary in order to obtain good results. The different arrangements of screws, trommels, &c., which have been employed for this purpose, are generally simple and well known to most persons who are ever likely to be called upon to use them. Without dwelling, therefore, on the machinery of sizing, I shall proceed at once to the description of apparatus for treating sized stuff.

Perhaps the most universally serviceable machine for ore-dressing is the jigger, a machine which was originally of exceedingly simple construction and operated entirely by hand. It has, however, now been brought to a great degree of perfection; and a large number of machines, all resting upon the same general principle, and differing only in minor points, have been invented. It would be impossible within the limits of this chapter to describe the various patterns which have been built, but as there are only three main varieties of them, a general description will not be difficult.

The idea of a jig was originally derived from the treatment by hand of ore on a sieve under water. By plunging the sieve down suddenly in the water, and allowing the particles to come again to rest upon it, a separation is effected, and if the stuff has been sized, and the operation has been sufficiently often repeated, the denser particles are found in strata under the less dense. If the mass on the sieve is then divided into horizontal layers, ore and gangue may be separated. The first mechanical jig had contrivances for imparting motion to the sieve; but it was afterward found that the same results could be obtained by using a submerged stationary sieve and imparting a vertical oscillatory motion to the water. This is done either by means of pistons or elastic, pliable plates, of rubber cloth or some such material, placed in the sides of the box or on the top of a lower chamber full of water and communicating with the box containing the sieve. An additional feature of recent mechanical jigs is the continuous discharge.

Piston-jigs may be divided into two classes: those in which the piston is placed below the sieve, and those in which it is situated at the side or behind the sieve, in a box communicating freely below with the box containing the sieve.

The jig with a piston under the sieve operates as a pump, and is known in Germany, where such machines are most used, as a *setz-pumpe*. It is preferred at many of the best ore-dressing works to those with a side-piston, on account of simplicity of construction and economy of working. An excellent machine of this class has been invented and tested by Dr. F. M. Stapff, an engineer in the service of the Swedish government. This gentleman, wishing only to further the introduction of good

dressing-machinery, refused to take a patent on his machine, so that any one is at liberty to construct a jigger after his pattern.*

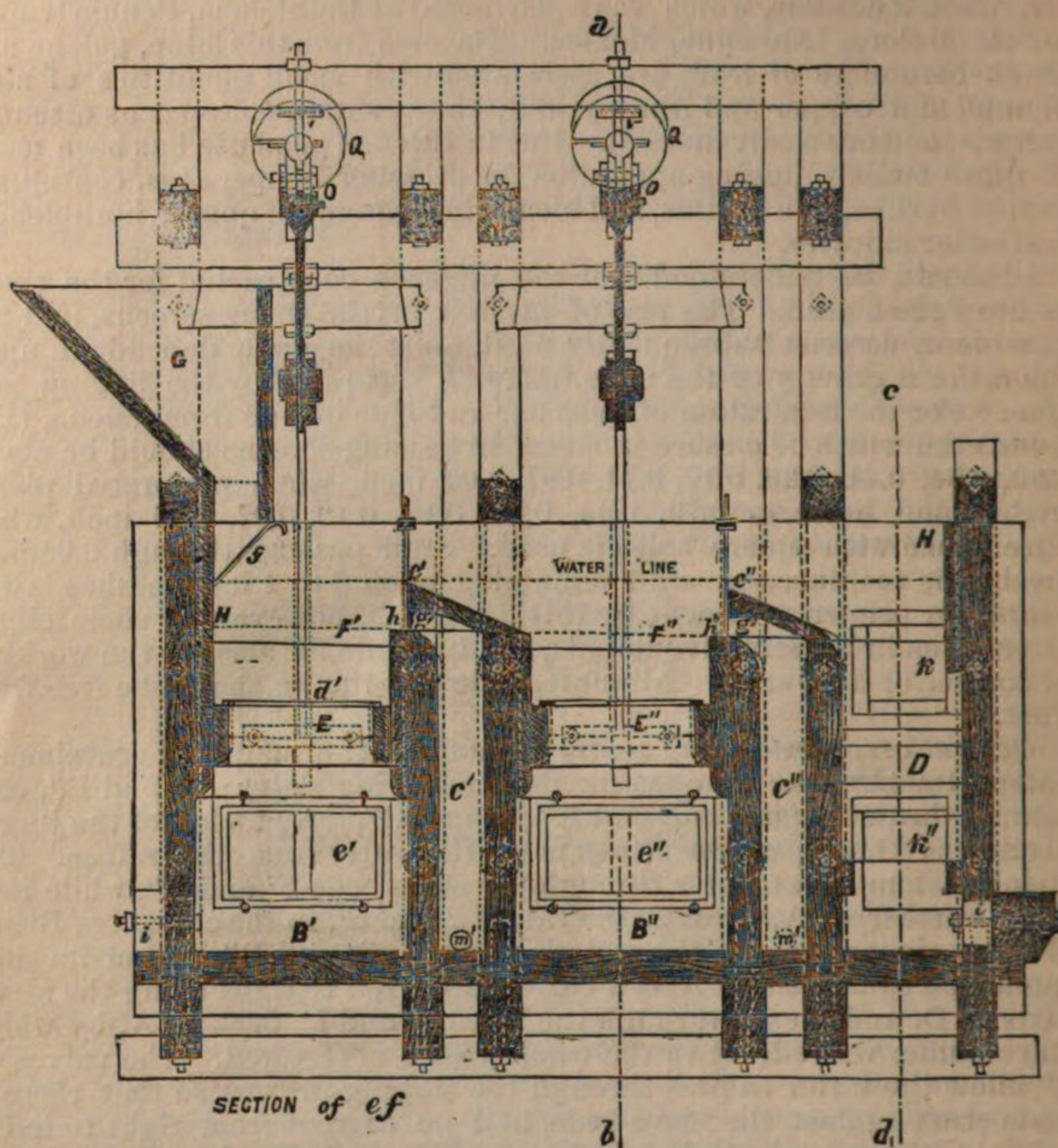
The cut subjoined represents a machine built in full accordance with Dr. Stapff's designs, which was constructed at Bethlehem, Pennsylvania, for the Dolores lead-mine, Mexico. The ores from this mine, galena and black carbonate of lead, are associated with small quantities of zinc-blende, and copper and iron pyrites; they contain calcspar as essential gangue, and are easily dressed. But in Sweden good use has been made of quite similar jigging-apparatus for dressing copper-ores, containing copper pyrites, iron pyrites, and blende in a gangue of quartz, hornblende, and other silicates.

It should be understood that the jigger is constructed for the treatment of sized stuff. The size of meshes in the sizing-screens, and the number of screens subsequently used, must be made dependent upon the specific gravity of the minerals to be separated by the jigging process. For the separation of calcspar and zinc-blende from galena, (Dolores,) the width of meshes in successive sizing-screens should be about 1.00, 0.64, 0.41, 0.26, 0.17, 0.11, 0.07, 0.04 inch, when perforated plates with round holes, or 0.70, 0.44, 0.29, 0.18, 0.12, 0.07, 0.05 inch, when wire gauze with square holes is used. Stuff passing through 0.04-inch meshes is too fine, and stuff remaining upon $\frac{3}{4}$ to 1 inch meshes is too coarse for proper treatment by this jig, which, however, by some slight alterations in constructive details, can be made fit also for the working of coarser or finer stuff. All material fed on the jig should be free from dust.

General arrangement and modus operandi.—The main box contains six compartments, viz: A, open for the circulating water; B' and B'', containing the pump-pistons E and E''; C' and C'', receptacles for the jigged products; D, a space for filtration of the water from the refuse. The rising pistons press water through the sieve-beds F' and F'', while they draw water from A, through the valves e' and e'' , to the chambers B' and B''. A consequence of the water's rising in B' and B'', and of its sinking at the same time in A, is a current from left to right along the sieve-beds to D, and thence through the holes k' and k'' back to A, by which the medium water-level in the whole vessel is restored. The valves d'' allow the water to pass through the sinking pistons, so that there is no suction against the sieve-beds, and no current from right to left is effected by the back-stroke of pistons. Sized stuff fed upon the sieve-bed F', from hopper G, is jigged by the thrusts of water from below; but at the same time being exposed to the horizontal water-current, its lighter particles are carried across the ridge c' , and after being exposed to a new jigging operation on sieve-bed F'', the refuse is carried across the ridge c'' to the chamber D. The heaviest parts of the jigged ore move close along the sieve-beds F' and F'', and enter the receptacles C' and C'', through the gates g' and g'' , respectively. Screens of woven wire, attached before the holes k' and k'' , prevent the refuse from being carried to chamber A. Along the inclined screen l'' , the refuse is led to a discharge-opening, m'' . Continual feeding from hopper G is regulated by moving the plate f , which allows more or less stuff to be drawn from the hopper by the fluctuations of the water. The regular horizontal movement of the ore from left to right is promoted by a slope of sieve-beds of 1 to 36. By slides h' and h'' , in front of the openings g' and g'' ,

* Stapff's continuous jig was described at length in my fourth annual report, (1872, p. 493.) The drawings and the essential parts of the description are here repeated.—R. W. R.

the quantity of products entering the receptacles C' and C'', is so regulated that the upper surface of the ore in process of treatment is about level with the ridges C' and C''. If plenty of water (one cubic foot per

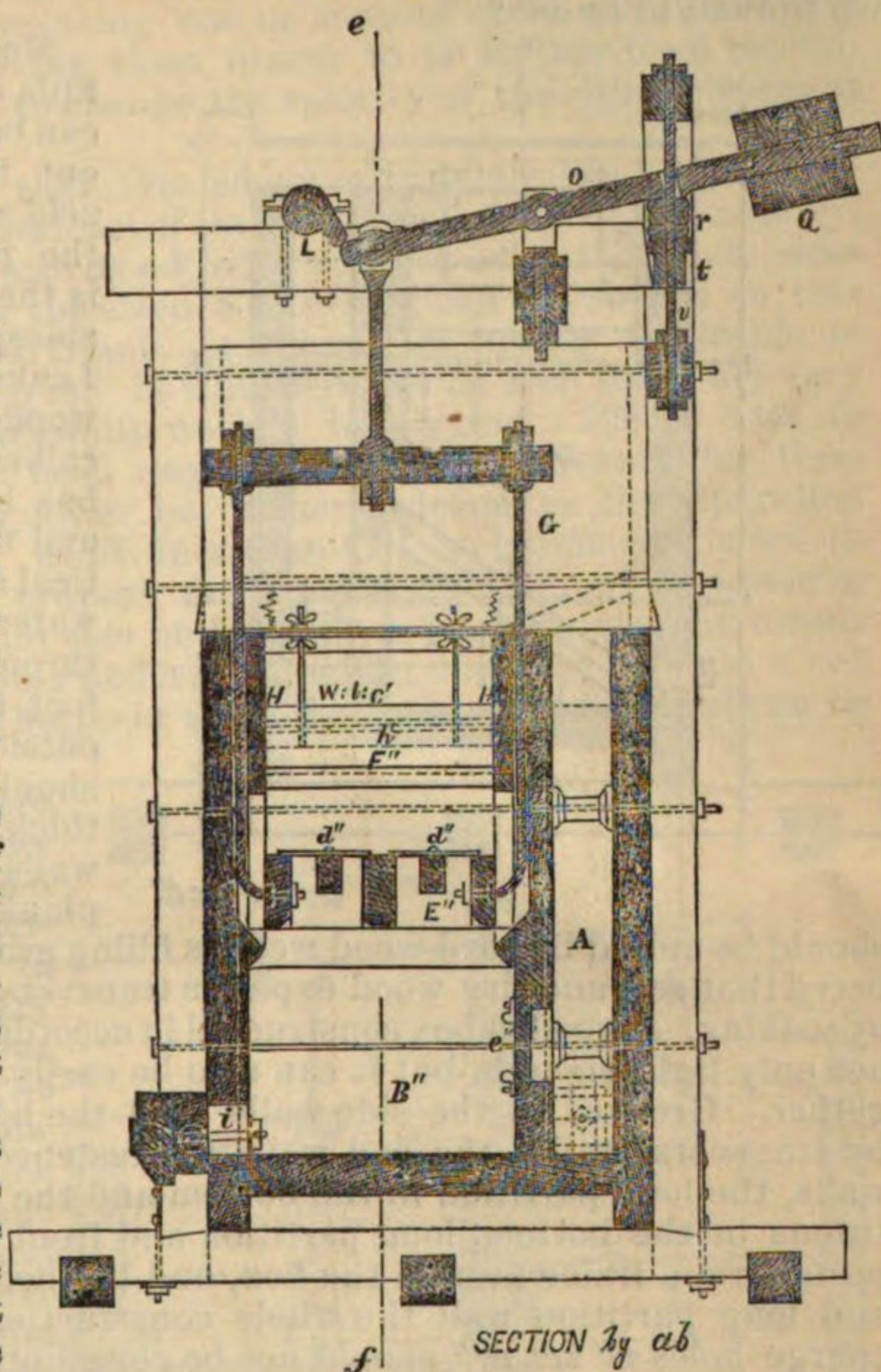


second) can be disposed of, the discharge through the holes m' , m'' , m''' , from the chambers C', C'', and D, should be continual; but if water is scarce, the receptacles C' and C'' are emptied periodically. The refuse-hole m''' should never be wholly closed, in order to allow the refuse to escape continually with a certain quantity of water, which has to be replaced from above.

The pistons, by through-rods and cross-heads connected with levers O, receive their movement from cams L, working against the lever. It being favorable for the jiggling process that the pistons sink slowly, but rise rapidly, the down-stroke is caused directly by cam, and the up-stroke effected by a counterpoise Q, on the end of lever O. By alteration of the weight of this counterpoise, the velocity of the rising pistons may be changed at pleasure. Fine ore must be jigged by short strokes, coarse ore by long ones. For changing the length of stroke at pleasure, a set-screw, *t*, is placed over the guide-bar *v* of the lever O. By this means the back-arm of lever O can be raised so much that the cam L does not catch the head of the other level-arm at all. Then the piston will rest, though the cam-axle is rotating; or it can be lowered sufficiently to

allow the cam to catch the lever-head 3 to 4 inches above the releasing points, and then the stroke will be about 3 inches. The set-screw can be moved along the guide-bar while the machine is in full motion. An elastic cushion of rubber, *r*, is applied above the set-screw, to moderate the shocks of the falling lever.

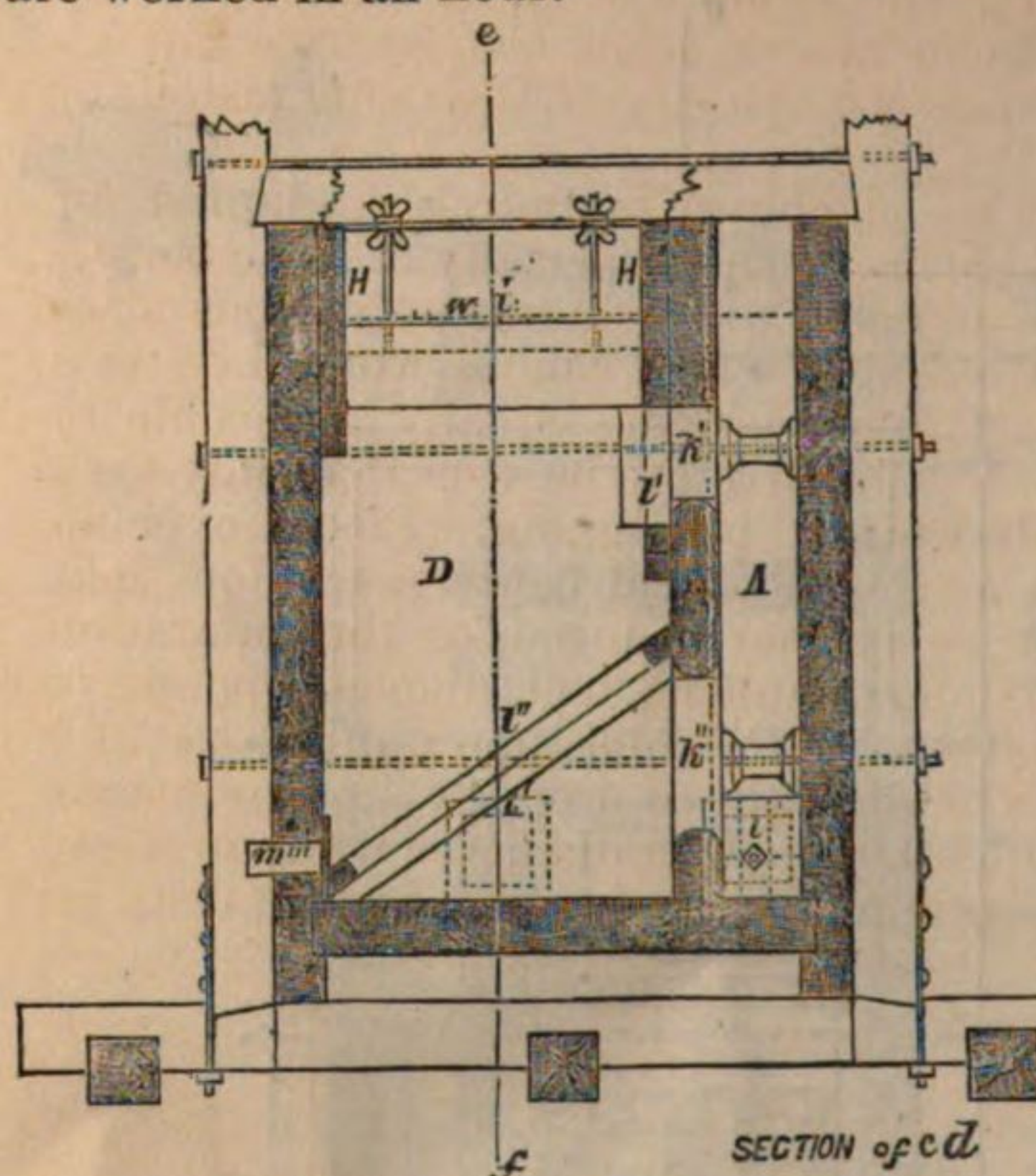
All other circumstances unchanged, the quantity of ore jigged in a certain time depends essentially upon the number of piston-strokes. But this number must not be increased so much that the ore on the bed has not time enough to settle between two strokes, consequently the jig should be run slowly, (about 60 strokes a minute,) if coarse ore is jigged by long strokes, and fast, (about 180 strokes a minute,) if the finest ore is jigged by very short strokes. The most favorable number of strokes in any case can easily be produced by running the driving-belt on one of the three pulleys of different diameter on the same cam-shaft.



From the preceding it is easy enough to see the wide applicability of this jig. If the hopper is regularly filled, and everything else regulated in accordance with the nature of the ore jigged, viz, supply of water, number and length of strokes, feeding (by regulator *f*,) discharge, (by regulators, *g'* *g''*,) outlet of water, products and refuse, (by holes, *m'* *m''* *m'''*,) the receptacle *C'* will receive the heaviest ore, receptacle *C''* an intermediate class of ore, box *D* gangue, or rock fit for the stamp-mill. The products of the jigging process, and the further operations they have to pass through, vary in accordance with the mineralogical character and the size of the treated material. Fine Dolores ore will give galena and lead carbonate in receptacle *C'*, blende in receptacle *C''*, and calcespar in box *D*; coarse Dolores ore, galena and carbonate in *C'*, blende, mixed with galena, carbonate and spar in *C''*, spar, with little blende, and traces of lead ore in *D*. In this case it is necessary to submit the crushed products from *C''* and *D* to further dressing operations.

The power necessary to drive this jigger depends upon the area of pistons, and upon the number and length of piston-strokes. Half a horse-power is in all cases sufficient to work a jigger of 18 by 18 inches piston area.

The quantity of material worked in a certain time is greatest if the stuff is rich and of middle size. Of poor copper ore, 6 to 7 cubic feet are worked in an hour.



Most of the constructive details of a jigger built of wood can be seen from the cut, without further explanation. If acid water is to be used for the jigging operation, wood is the best material; and, besides, it is the cheapest. Leaks in a well-constructed wooden jigger-box are usually calked by dirt after the jigger has been used for some time, and besides it is of no practical account if a few drops of water leak from a vessel through which $\frac{1}{3}$ to 1 cubic foot is run per second. The outside walls of the jigger-box should be at least 3 inches thick, the interior partition walls 2 to $2\frac{1}{2}$ inches. The planks forming these walls

should be united by hard-wood wedges filling grooves. It must be remembered that soft and dry wood expands transversely about $\frac{3}{4}$ inch per foot by soaking. A wooden box constructed in accordance with the cut remains not only tight enough, but it can also be easily taken apart and put together. Grooves in the side-walls hold the bottom, which is stiffened by transverse rails; the end walls are fastened in the bottom and side walls, the long partition in the bottom and the end walls, the short partitions in the bottom, long partition and front wall. Bottom rails and posts form a frame around the box, and by pieces between the rear wall and long partition wall the whole construction is secured. The discharge holes m' m'' m''' should not be closed otherwise than by wooden plugs or exterior trap-doors, which by weights working on knee-levers are pressed against nozzles. Close above the bottom are gates i for cleaning the chambers A B' B'' D' when they become obstructed by dirt.

The pistons do not slide directly on the walls of partitions B' and B'' , but on hard-wood linings, which can be replaced, piece by piece, if necessary. The main valves c' c'' , of rubber, are stiffened by thin sheet-covers; their wooden valve seats are kept in place by buttons. Each piston is covered by four light rubber valves.

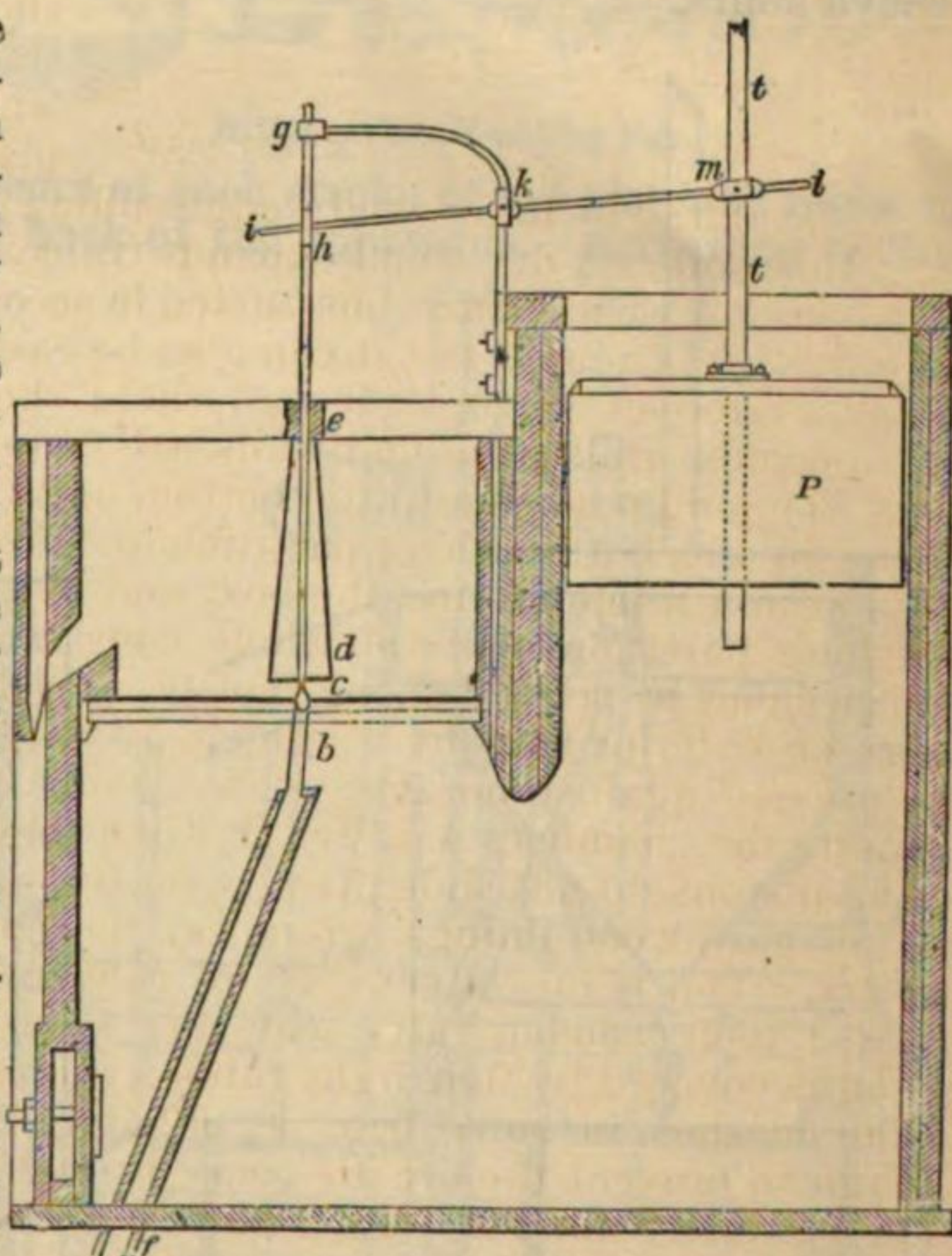
The meshes in sieve beds F' F'' and in screens b' bb'' must be fine enough to prevent the ore to pass through. But it is not necessary to use as many different sets of sieve beds and filtrating screens as there are sizes of ore. Two sets answer all practical wants. Wire-gauze with very fine meshes, which has to be used if the finest stuff is worked, should always be protected against too speedy abrasion by wrappers of coarser gauze. The frames covered with wire-cloth (F' F'' b' b'') rest loosely upon and behind wooden strips, and are kept in position by the large frame H , which is common for all compartments in the front part of the jigger. This frame contains the ridges c' c'' and the gates f h' h'' which move in grooves; f is kept in position by friction only, h' and h'' by wing-screws besides.

Behind frame H and sieve beds F' and F'' move the piston rods in spacious grooves. The lever-heads receiving the motion from cams L must be covered with steel; the counter-weights are disks of metal, kept in place by eye-bolts. By replacing one or more of those metal disks by wooden disks, and by moving them nearer to or farther from the fulcrum of lever o, it is easy to change the velocity of the rising pistons at pleasure.

There can be no doubt that this machine is admirably adapted for separating ores; and not the least of its merits, especially in this country, is the ease with which it can be adjusted to work ores of various sizes and kinds. The limits for the sized stuff which can be worked on this machine are given by Dr. Stapff, and these are equally applicable to other well-constructed jiggers. It will therefore be seen that only very fine stuff cannot be successfully worked by jiggling. Pieces over an inch in diameter scarcely need any mechanical contrivance for their separation. They should either be further reduced, or the separation should be made by hand. Stuff finer than 0.04 inch diameter is apt to cake upon the sieve, and prevent the water from thoroughly loosening up the particles. It would also be difficult to properly size, by means of sieves or trommels, grains under 0.04 inch in diameter while in a wet condition, and it must be borne in mind that only sized material can be jigged to advantage.

I deem it unnecessary here to give any drawings or description of jiggers which can be worked only intermittently, or of those in which the water is stationary and the sieve is movable. Such machines are but little less expensive than the piston-jiggers, and are not capable of working more than about one-third the amount of ore per square foot of sieve in a given time. Only under very peculiar conditions would any well-informed engineer construct such a machine.

One of the simplest forms of the piston-jig is shown in the figure.* It is made of wood, with a piston or plunger P at one side, which, on being forced downward upon the water in the box, causes an upward flow through the grate in the direction b to c. The peculiarity of this construction, due to Mr. Vogel of Joachimsthal, and Mr. Wimmer of Claus-

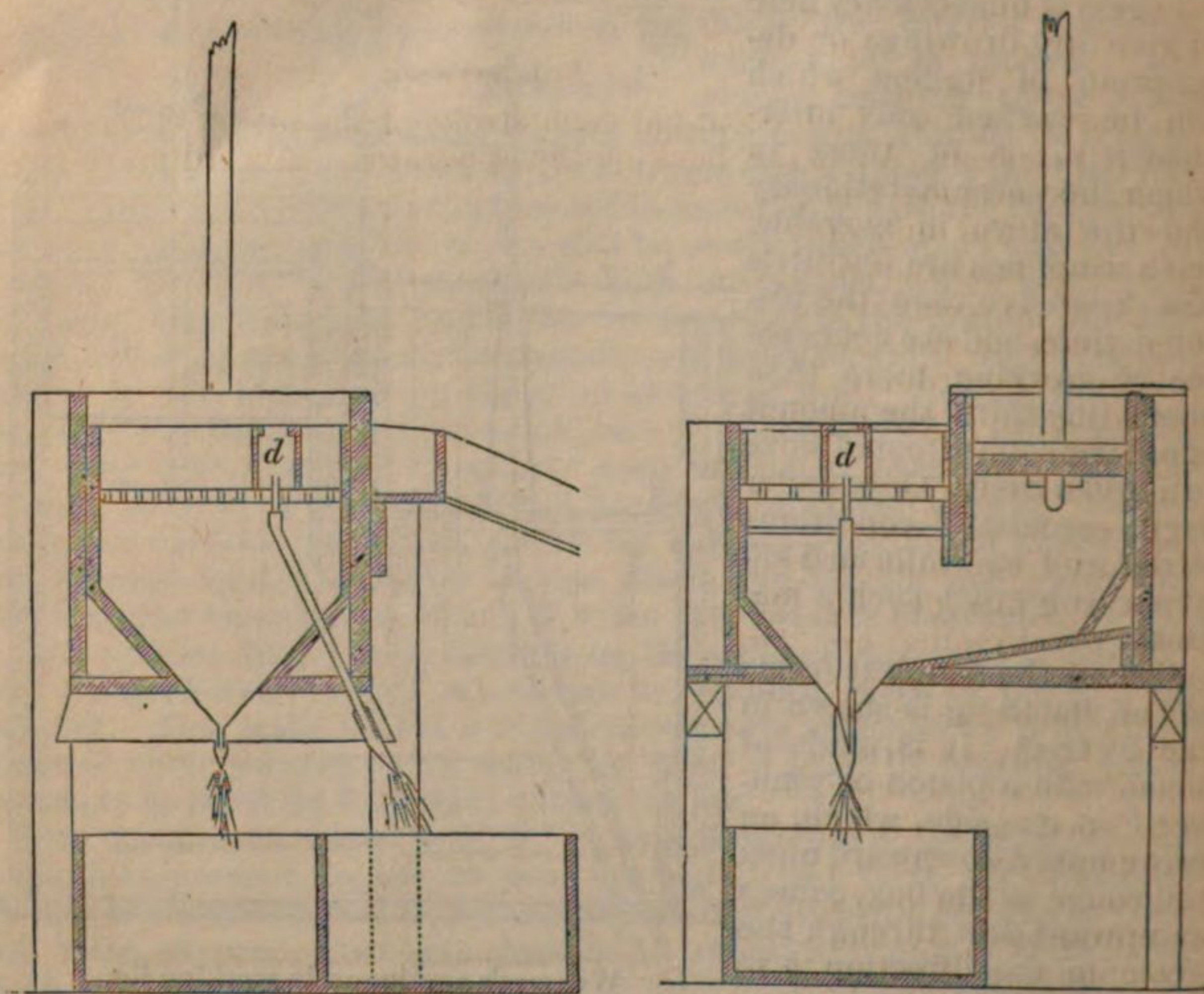


Wimmer's continuously working jig.

* This and the descriptions of jiggers immediately following are taken from my second annual report, (rendered in 1870,) pp. 702 *et seq.*—R. W. R.

over the partition in front. But it was found that the downward current of water, when this valve was opened, was sufficient to carry down some of the waste stuff from the top; and it became necessary to devise some means of preventing this flow. This was effected by covering the outlet with a conical tube, *d*, supported from a bar of wood above and reaching down through the layer of poor stuff so low that only the heavy and richer portions resting directly upon or near the sieve can pass downward into the discharge-pipe *b f*. This pipe is alternately opened and closed at the top by an iron stopper placed at the end of a vertical rod, the upper part of which slides through a supporting-ring, *g*. By means of an arm, *i*, supported on a pivot at *k*, the stopper is alternately raised and lowered as the piston *P* rises and falls. The opening in the discharge-pipe is thus opened when the piston descends, and is closed when it ascends. It has been found in practice, however, that this arrangement for opening and closing the discharge-pipe does not give satisfactory results.

A somewhat similar machine, in use in the Harz, is shown in section by the next figures. The outlet in the sieve is surrounded by a perforated cylinder, *d*, so as to prevent the refuse from entering, while the ore escapes through the tube and is delivered at the side. From five to six cubic meters of stamp-stuff can be passed through this apparatus in twelve hours.

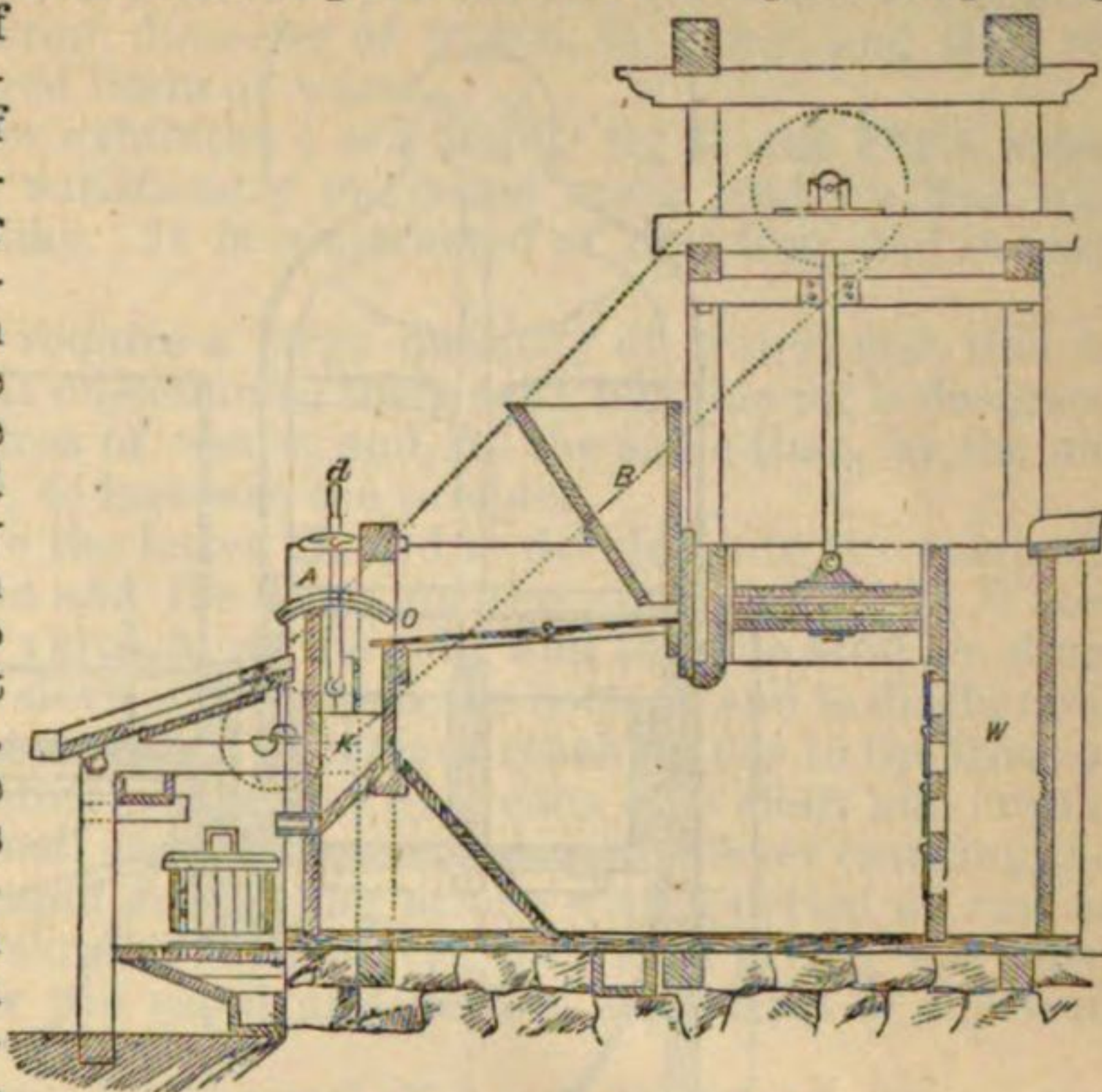


Self-discharging jig—Harz.

One of the best jigs of the continuously-working class is the invention of Rittinger, and was exhibited at the great exposition in Paris in 1867.

It is represented in the annexed figure, and is characterized by the inclination of the grates and the lowness of the front partition, over

which the poor and lighter stuff falls continuously, and with very little water, while the heavier and richer portions fall through the opening or slit *o* at the base of the partition. This partition is the segment of a cylinder, and is supported upon the lever or arm *d*, so as to be movable back and forth in such a manner that the opening or slit *o* may be increased or diminished at pleasure. The heavy stuff, passing through the opening, falls into the box *K*, from which it is removed as required. The inclination of the grate in this machine is from five to eight degrees. It is fed through the hopper *B*, which plunges below the surface of the stuff accumulated on the grate. The loss of water which occurs at each stroke of the piston is replaced from a reservoir, *W*, at the back of the apparatus. According to Rit-

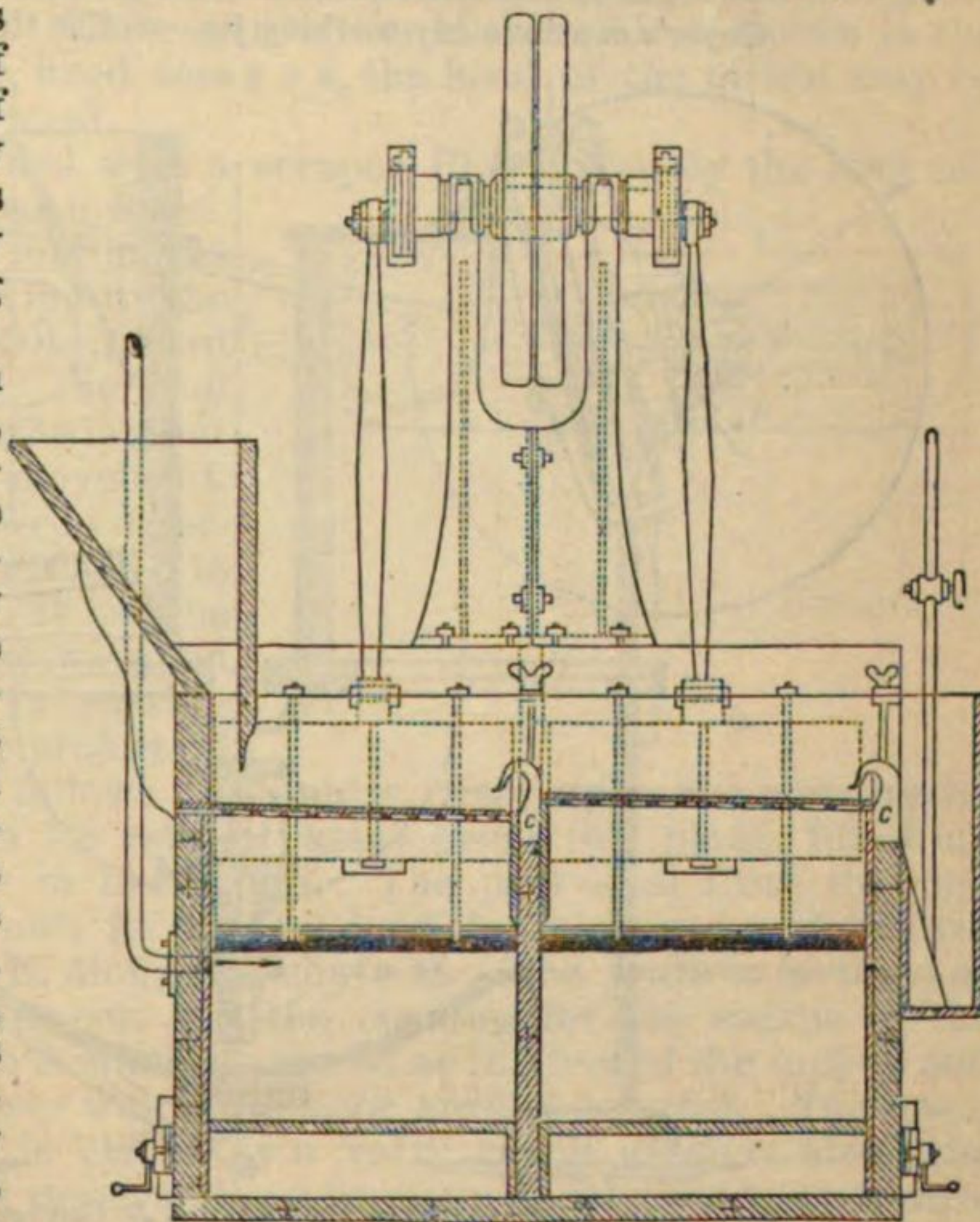


Rittinger's self-acting jig.

The loss of water which occurs at each stroke of the piston is replaced from a reservoir, *W*, at the back of the apparatus. According to Rit-

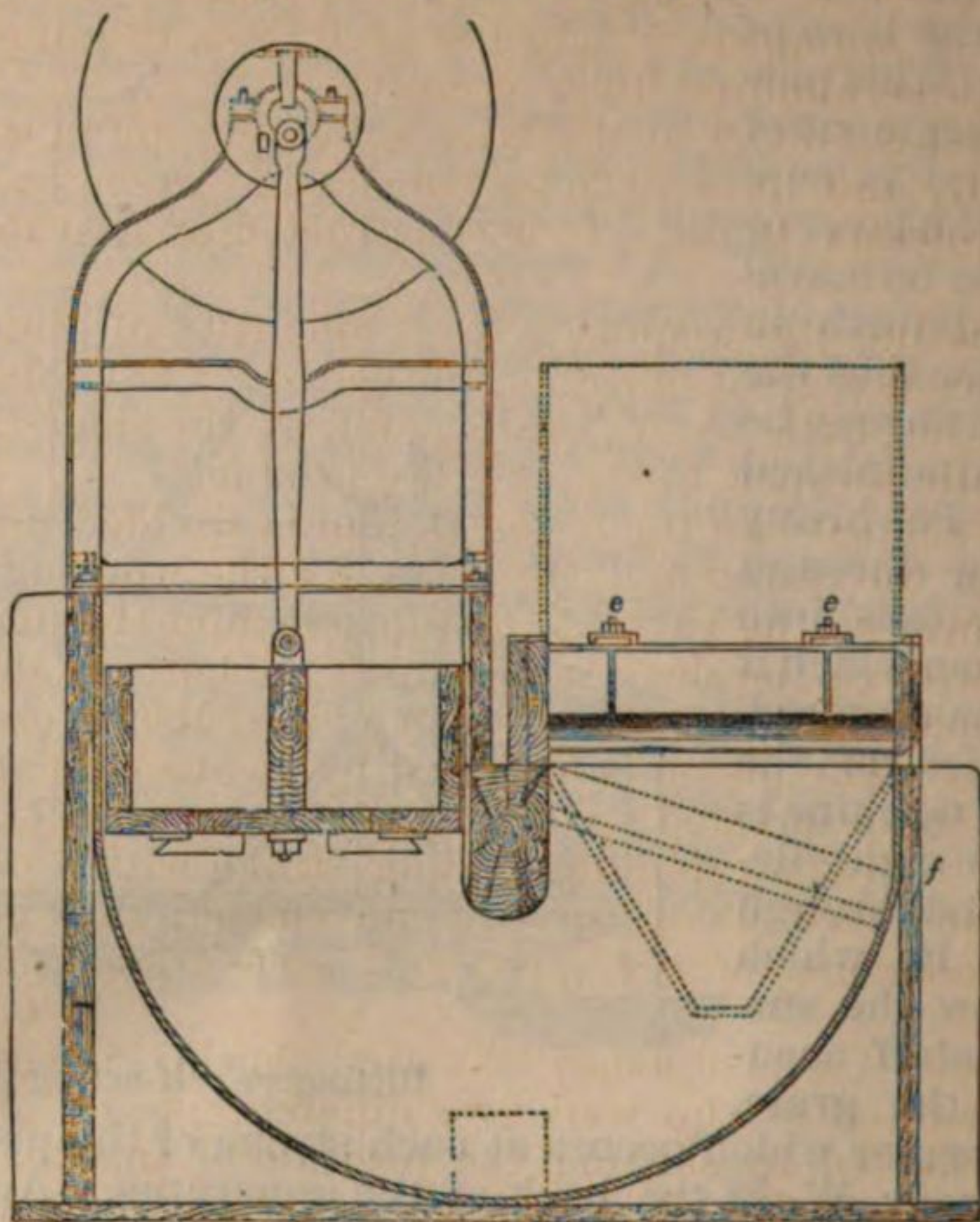
tinger, experience has shown that the duty of self-acting machines of this kind is generally three times as great as that from the ordinary intermittent working apparatus.

In 1863 Mr. Geyer, an engineer from Baden, introduced continuously-working jigs into the great ore-dressing establishment erected by him on the banks of the Lahn. In the construction of these machines both wood and metal were employed. The arrangement of the parts is represented by the accompanying figures. It is a double machine, composed of two grates and two pistons, actuated simultaneously by means of cranks on a shaft above, the motion being communicated by two connecting rods. The grates are inclined forward, and are provided

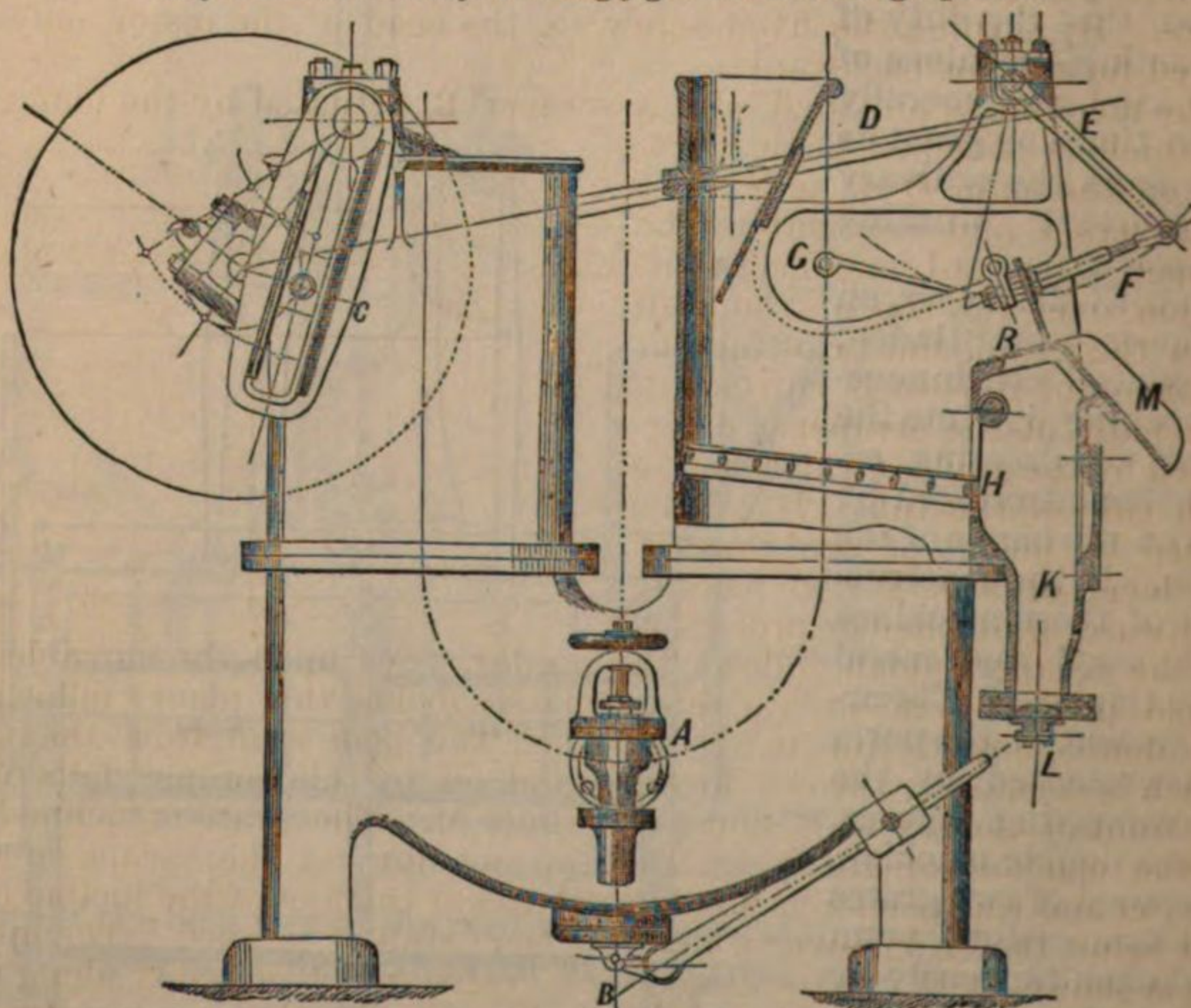


Geyer's continuously-working jig.

with a chink or gutter at the lower edge, through which the concentrated ore falls into inclined troughs *c*. The stuff passes from one grate to



Geyer's continuously-working jig—section through piston.



Automatic jig of Huet & Geyler.

another, and thus two different grades of fineness may be secured. Iron plates or partitions are placed so as to govern the discharge, and these

may be raised or lowered at pleasure by the thumb-screws *e e*. These machines, worked at seventy strokes per minute, will wash about nine cubic meters of stamp-stuff, diameter of 0^m.005, in a day, and they require about three hundred liters of water.

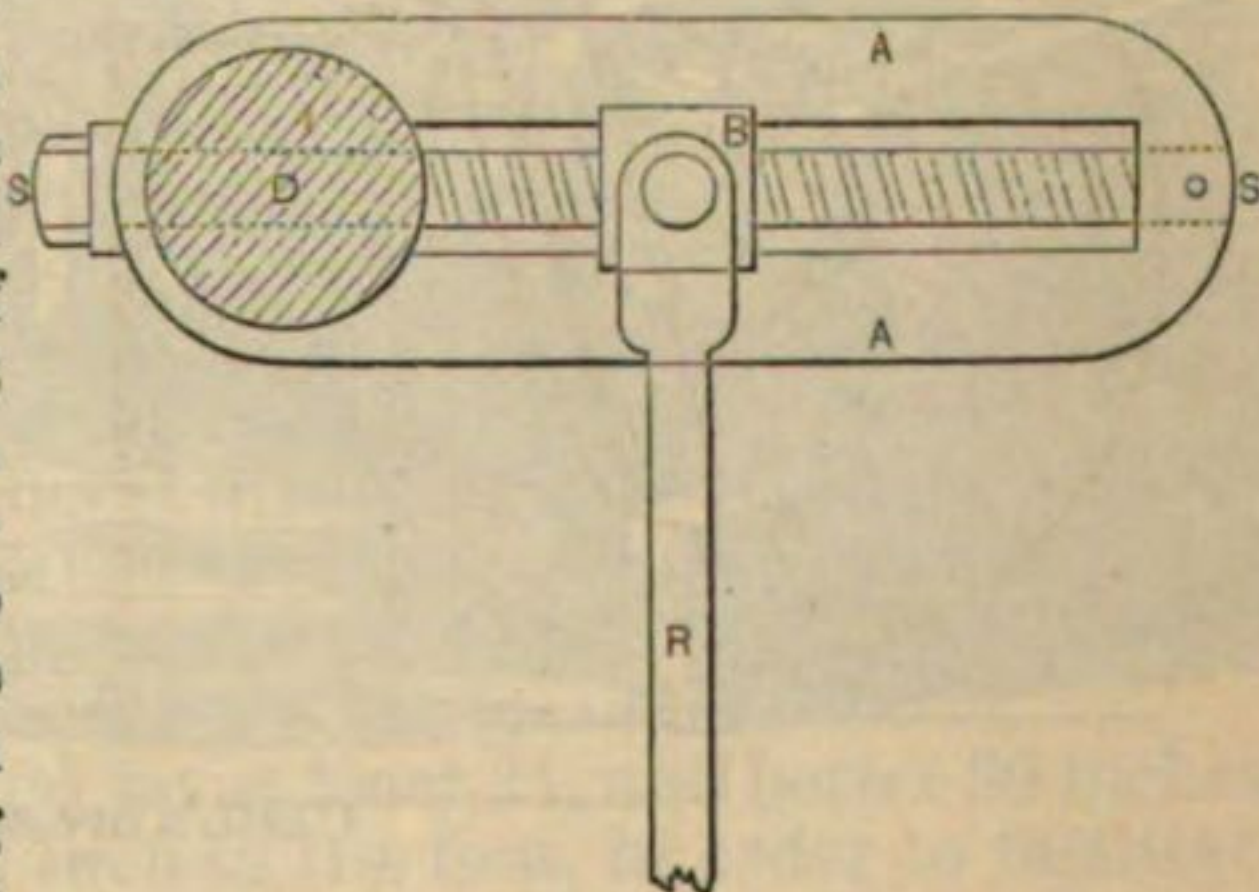
Messrs. Huet & Geyler exhibited a self-acting jig at the Paris exposition in 1867, and its satisfactory operation upon lead-ore was witnessed by Professor Blake. It is constructed of cast iron, and is very compact.

Most self-acting jigs require a large quantity of water, and this in many localities is a great objection to their use; but this jig is designed to work with but little loss of water, and, at the same time, by the aid of an automatic scraper, to increase the product.

The tub is shaped like the letter **U**, and is divided into two compartments, one for the piston and the other for the working-grate. Water is supplied through the valve **A**, at the side, and the fine stuff or slime which falls through the sieve settles upon the bottom, and is discharged through an opening, **B**, controlled by a lever reaching out to the front of the apparatus. The piston is operated by means of a shaft and crank, which works in an inclined slide, **C**, connected with a lever carrying the piston, so as to give a rapid descending stroke with a period of rest at the bottom, and then a slow upward movement; thus giving the most favorable conditions for the rapid and perfect separation of the stuff upon the grate.

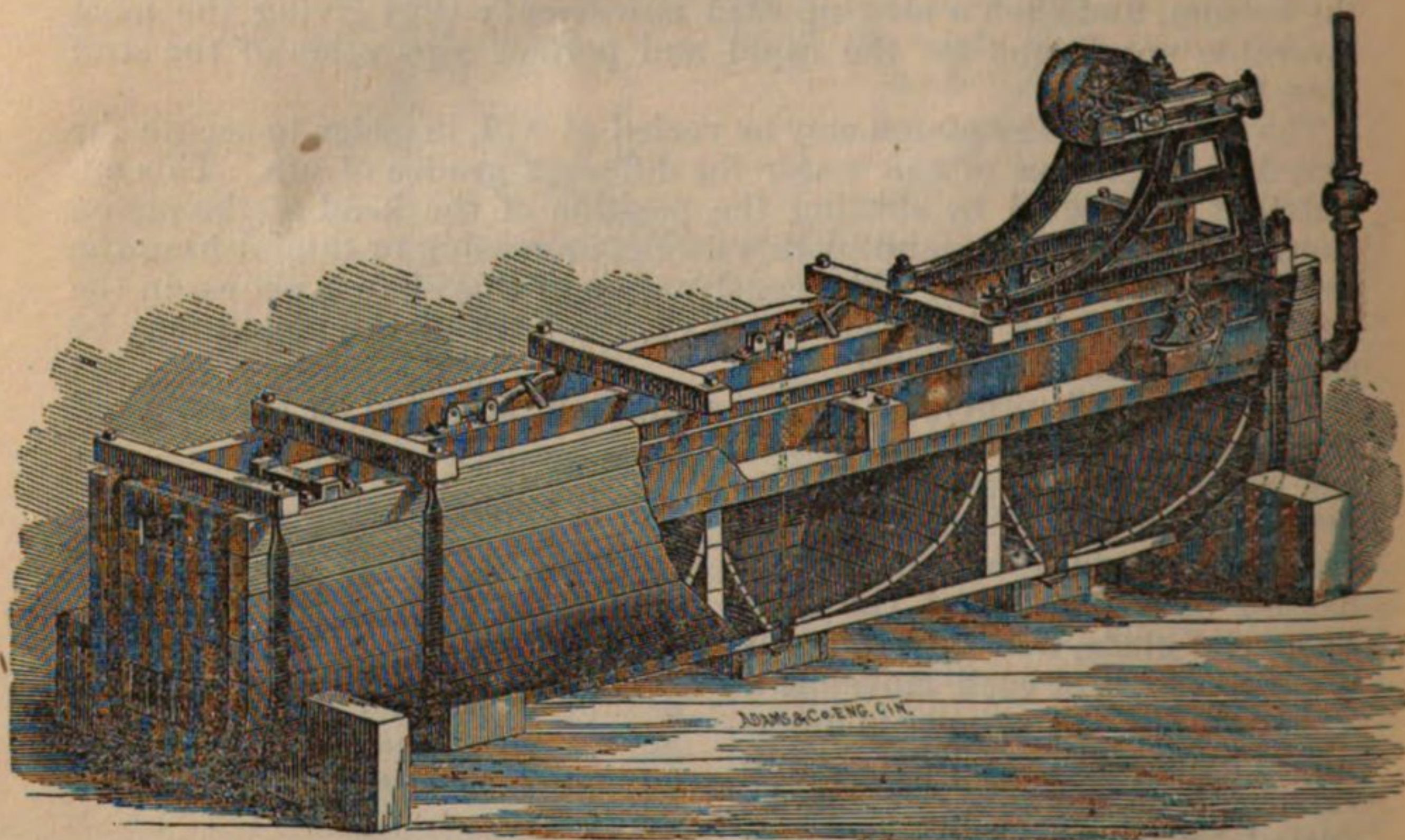
The motion of the piston may be varied at will, in order to secure the best flow or motion of the water for different grades of ore. This adjustment is effected by shifting the position of the head of the piston along the lever or arm, and by this means increasing or diminishing the amplitude of its motion. The construction of this slide is shown in the figure. By turning the fixed screw *s s*, the head of the piston may be moved forward or backward.

The machine is provided with a scraper **R**, actuated by the long rod **D**, which is attached to an eccentric on the main shaft and moves the levers **E** and **F**, giving to the scraper a forward and backward motion over the top of the stuff upon the grate, and throwing out a portion of it at each movement. The path of the scraper is determined by the guides **G**, attached to each side of the tub. It can be varied by means of screws upon the lever or arm **F**. In passing backward, the roller or projection on the scraper, which follows the guides, rises upon the movable inclined plane **G**, and on its return passes below this plane, following the double-dotted line in the figure. The poor stuff from the top, which is constantly thrown forward and off by this scraper, falls over the front of the tub at **R**, along the chute **M**. The grate is inclined as in the machine of Rittinger, and the opening for the escape of the heavier and rich portion is similarly placed at the foot of the incline and just below the bridge over which the poor stuff is scraped. The opening is shown at **H**. It is closed by a valve which extends along the whole front edge of the sieve, and can be opened and closed at pleasure by a lever. The stuff passing through this valve falls into a receptacle **K**, from which it may be removed at pleasure through the opening **L**.



The scraper is so made of perforated sheet-iron that it does not throw the water out together with the waste. These jigs are made with great care and accuracy.

Mr. F. Cazin, Rose Clare, Hardin County, Illinois, is the inventor, and Messrs. Morry & Sperry, of New York City, are the agents of a new ore-separator, which consists essentially of three jigs, arranged end to end. It is continuous in its action and has but one piston and piston-rod, a disposition which, as all who have worked the ordinary machines know, saves a great deal of complication and permits a much simpler and cheaper construction than is possible when three separate pistons have to be actuated from a through shaft, or by connecting rods from the first piston. The peculiarity of this machine is that the piston is hinged at one end, opposite the last sieve, and the piston-rod is placed, not in the center, but at the other end, opposite the first sieve. It lies the whole length of the machine, and at the side of the sieves. This peculiar arrangement gives each sieve a stroke of its own, entirely different in strength and length from that of the others. The undressed ore is run on the first sieve and receives the longest stroke, that is to say, the most thorough agitation the piston is capable of giving. On this sieve pure mineral and a mixture of middlings and poor are obtained.



Cazin's ore-separator.

Of course the middlings will be at or near the top when they arrive on the second sieve. There the action is less energetic; the middlings are taken off and the poor ore passes to the third sieve. This poor ore, though often thrown away, still contains some mineral, adhering in the form of fine particles to larger grains of rock. The difference in gravity between these grains and those which are composed of rock alone is very small, and in a violent stream the two sorts are constantly remixed, so that separation is not effected. But a quieter action will separate the absolutely worthless from that which has some value, so that on the third sieve a product which may still be worth reworking is obtained, while the gangue passes off to the tail-race.

Whether the machine will be equally effective in separating an ore

containing two or three minerals of different specific gravities, is a question to be decided by trial. Each sieve would certainly afford one mineral separated from the other two, but with the peculiar action of the hinged piston it seems to be reasonable to expect that the pure mineral of each sieve would be mixed with the lighter particles from the sieve above. This, however, could be afterward separated by a repetition of the process. This is one of the great advantages of the continuous jig. Its work is so rapid that a repetition of the operation, especially when performed on concentrated mineral, does not involve the labor that a single run through other machines occasions.

I have already mentioned a machine in which the oscillations are imparted to the water by the movement of pliable plates of rubber-cloth, or some such material, against which the water under the sieve exerts a pressure. A very good machine of this sort has been constructed by Mr. Morton, of Jersey City, and I regret my failure to obtain drawings of this machine, which has done some very nice work. It is capable of being adjusted to treat ores of various specific gravities and sizes, and in one or two cases, where the results obtained by this machine were unfavorable, or at least not so favorable as had been expected, I have no doubt that the failure was due either to attempting to treat too finely pulverized ores, or to the lack of a proper previous sizing.

Jigs constructed on the principle of Dr. Stapff's possess one advantage over those built according to any other plan. There is a positive upward current passing through the sieve which ceases perhaps during the downward motion of the plunger, but which is never reversed, as in the case of the others. In this way a more regular sinking of the particles thrown up by the upward motion of the current is accomplished. A downward movement of the water tends to draw down the lighter particles and mix them with the heavier rather than to facilitate their separation. With any jig of good construction it is possible to obtain three or more products, according to the constituents of the ore. In Europe these machines are frequently used to separate galena, blende, and gangue, and sometimes copper or iron pyrites is also separated on the same machine. There is no other machine employed for the dressing of ores capable of performing so many various separations of ores, and at the same time of treating material of such a variety of sizes, the only necessary condition being the one which I have already alluded to, viz, that the grains treated at any one time must be of nearly the same size.

Rittinger gives the following general dimensions, derived from practical experience, as the best for the construction of jigs :

1st. The opening of the feed hopper should be of from $2\frac{1}{2}$ to 3 inches area, and about 4 inches above the sieve.

2d. The length of the sieve should be at least 24, and better 30 inches, and its inclination about a half an inch to the foot, in order to facilitate the discharge.

3d. The height of the material resting on the sieve should not be over 4 inches at the lower end.

Settling-tubs.—A very simple machine for separating the particles of crushed ore, according to the rapidity with which they sink in water, consists of a cylindrical vessel full of water, kept in rotation by means of arms attached to a vertically revolving shaft. In many of the Cornish dressing-works this operation is performed by hand, a given portion of ore being placed in a tub, and the mixture violently rotated with a shovel. When the rotation has been maintained for a sufficient length of time, which varies with the quality and size of the material treated, the ore is allowed to settle, while the workman jars the tub by blows upon its

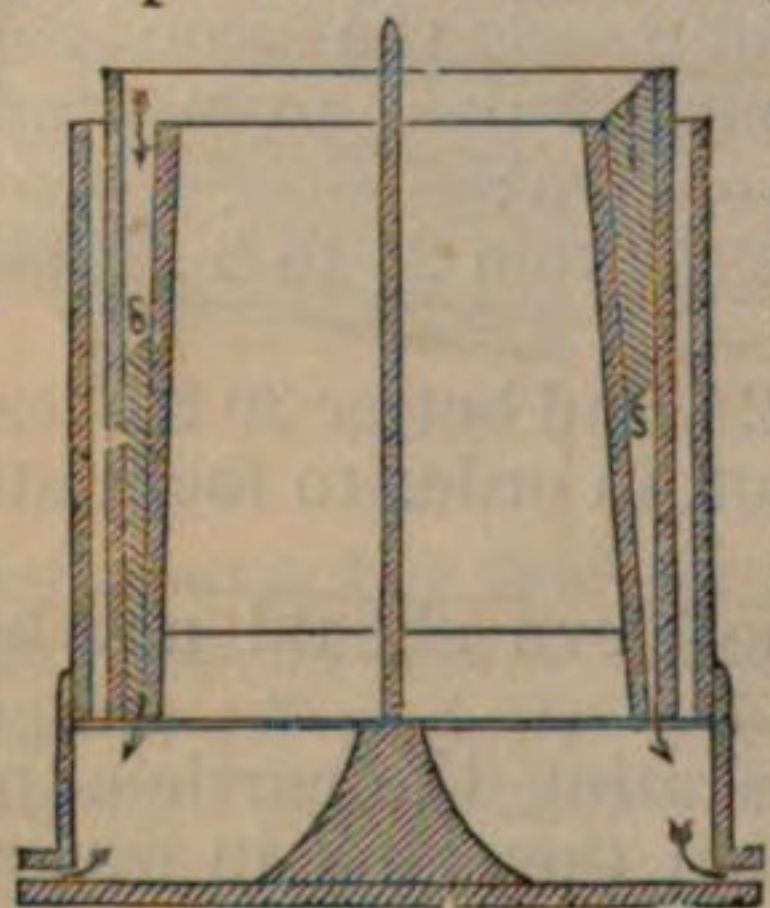
side with an iron bar, in order to prevent the adhesion of fine particles to its inner surface.

In Germany mechanical means are employed for rotating the charge. The rotation is not so rapid as to prevent the sinking of the lightest particles, and is varied to suit the ore treated. By the application, below the stirring apparatus, of concentric chambers, narrowing toward the bottom, and each terminating in a discharge-pipe, equal-falling grains may be separated into classes and caught in separate vessels. Thus the operation of the machine may be made continuous, no stops being necessary to remove the separated material. In order to prevent too great consumption of water, and to give the particles sufficient time for the operation of centrifugal force, the discharge-openings must be made as small as possible. The heaviest particles will of course be found nearest to the center. If a good separation of minerals, according to their specific gravity, is to be effected on this machine, a careful previous sizing is necessary, and the quality of the work done will depend to a great extent upon the accuracy with which this operation is carried out.

A regular rotation of the stirring apparatus is necessary, since, if it is run rapidly at one time and slowly at another, it is evident that the separation cannot be uniform. For this reason an independent motor, for example a small turbine-wheel, may be advantageously employed to drive it. The size of the stuff usually worked on these machines varies from $\frac{1}{40}$ to $\frac{4}{10}$ inches in diameter. Finer material can be worked, but not with equally good results. Machines are usually built large enough to work from 16 to 25 cubic feet of material per hour. They are usually from 2 to $2\frac{1}{2}$ feet in diameter.

The following varieties of settling-machines were described in the commissioner's report of 1870, in Professor Blake's treatise on mining machinery:

Hundt's settling-tub is a continuous-working machine, designed to separate or sort the particles according to their velocity of fall through the column of water. The particles of stuff entering this machine are subjected to two motions, the direct fall due to gravity, and the movement of translation due to the motion of the water. It follows that they take a diagonal course and reach the bottom at different distances from the point at which they entered the column.



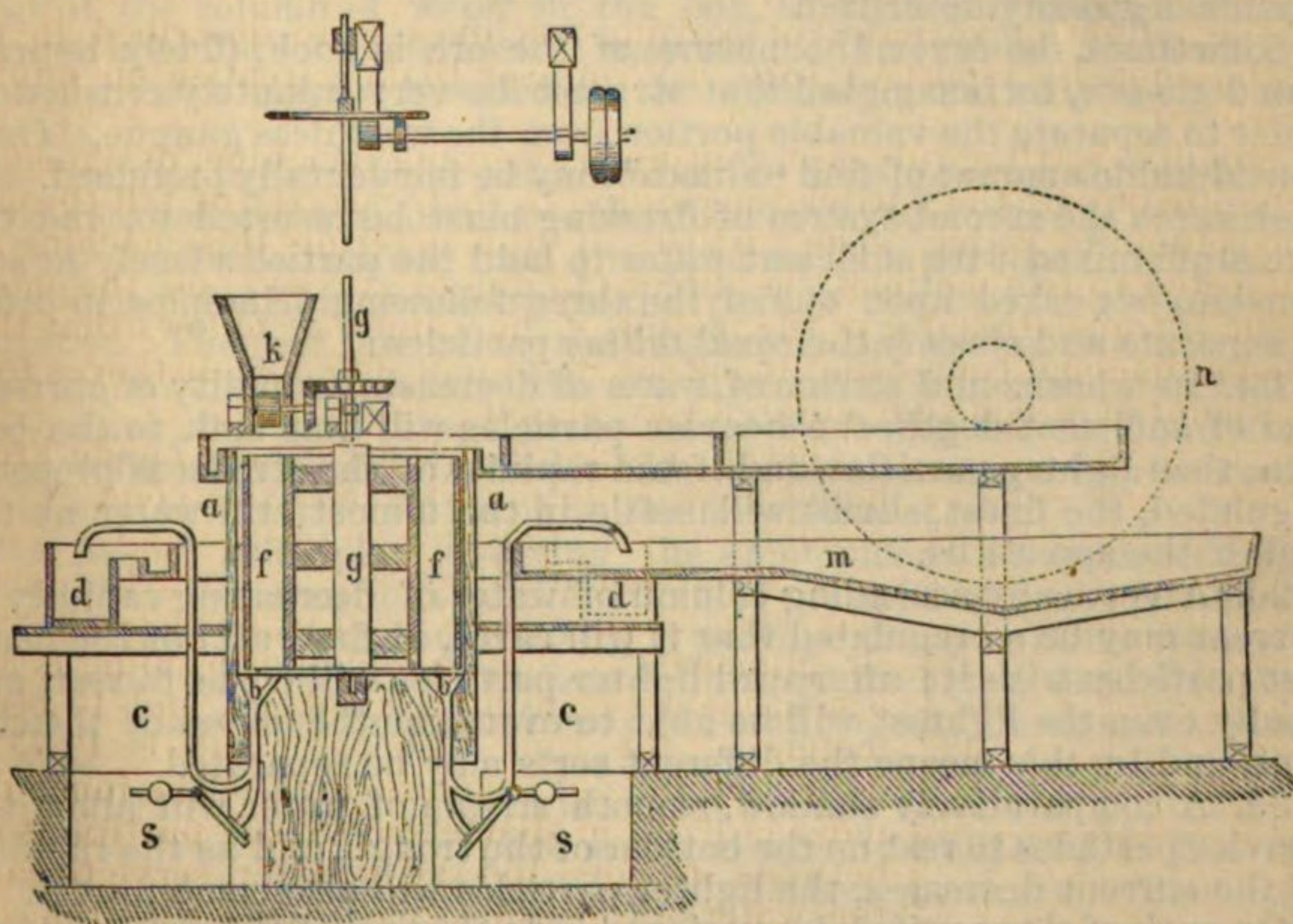
Hundt's settling-tub.

This apparatus was first used at the Landerkrone mines, near Wilnsdorf, in 1854. It consists of a circular tub, within which an open cylinder is supported and made to revolve by a vertical shaft. This cylinder is partly closed by means of a cone, so adjusted that only an annular opening is left, 5 centimeters wide at the bottom, and 13 centimeters at the top. The outer tub is 1^m.75 in diameter, and is 2 meters high. The inner cylinder is 1^m.60 in diameter. Small partitions *s s*, between the cone and the cylinder, serve to carry the water filling the space around with the cone and cylinder during their rotation.

The stuff to be treated is introduced in a continuous stream at the top, and in falling through this height of two meters of water, and being at the same time carried around by the revolution, is classified according to the rapidity of the fall of the particles. It may be withdrawn from the vessel by suitable openings around the bottom. By careful management of these openings, very little water is lost; and

this economy of water, and the very small quantity required for the proper working of the apparatus, renders it especially worthy of the attention of mill-men and metallurgists, in such regions in New Mexico, Arizona, Nevada, and Sonora, where water is scarce. The number of revolutions of the drum should range between 2 and 6 per minute, the diameter being 4 feet, and the size of the grain from $\frac{1}{32}$ to $\frac{1}{2}$ of an inch. Used with ore-stuff, particles of which differ in size, the machine sorts these particles according to their rate of fall. As the product in such a case would consist of small and dense particles mingled with larger ones of less specific gravity, the separation can readily be effected by the simple operation of sifting.

Rittinger's setz-rad is upon the same principle as Hundt's. It is a self-feeding continuous working-machine, and consists of a stationary wooden tub *a a*, the bottom of which is divided into eight conical compartments connecting with pipes *c*, which, after descending for a short distance into the foundation, turn upward and outward, and are curved at the end so as to deliver the water from the tub into an annular trough *d*. A double cylinder, *f f*, supported by a shaft, *g*, is made to turn in the tub *a*. The stuff to be separated is delivered in a constant stream through the hopper and distributor *k* into the revolving cylinder, and falling through the water in this space is sorted and collected in the conical reservoirs and tubes *b*. A branch tube, closed by valves *s s*, permits the removal of this concentrated stuff from time to time. The waste stuff, delivered through the tubes *b* into the annular trough *d*, flows into another trough or conduit *m*, whence it is lifted by the wheel *n*, and returned to the tub *a*.



Settling apparatus of Rittinger.

Rittinger in his *Aufbereitung* describes a machine of similar construction, in which the stuff is not received into an annular column of water, but into an ordinary tub in which the water is made to revolve by a wing-wheel, the wings of which would correspond in position to the sections of the cylinder *f f* in the last figure. The bottom is divided into eight radial compartments ending in funnel-like cavities, as shown.

With grains of lead ore $\frac{5}{32}$ of an inch in diameter, 91 per cent. of all the lead-ore contained in the stuff will be delivered into the second compartment at the bottom, and 8 per cent. in the next. But with grains $\frac{2}{32}$ of an inch in diameter; only 75 per cent. will be found in the second, and 20 per cent. in the third compartment.

Separation without sizing.—In the machines already described, the material to be worked must previously be carefully sized; but when very fine stuff is to be dressed, it is found impracticable to size it accurately and rapidly upon sieves or trommels; and for this reason an entirely different principle must be employed for treating it. It must, in the first place, be separated into *equal-falling* portions, the grains composing each portion being of such relative size and specific gravity that they will sink through a column of water of a given height in equal times. Each of these portions is then treated alone upon a machine capable of separating the particles according to their specific gravity.

Thus we see that, according to circumstances, ore may be dressed by a sizing operation, and a subsequent separation of the particles according to their specific gravity; or the separation, according to specific gravity, may be undertaken after a separation into portions consisting of equal-falling grains. In any case two distinct operations are necessary, and any method of dressing ores consisting of but one machine and one operation cannot possibly give as good results as machines worked upon long-known and thoroughly tested scientific principles.

When the stuff to be worked is not too fine to be separated on sieves or trommels, there can be no doubt that the most economical method is to size it first, and then separate it, according to specific gravity, on the machines already described.

Sometimes, however, the nature of the ore is such, (finely impregnated tin-ore, for example,) that it must be very minutely crushed in order to separate the valuable portion from the worthless gangue. Or, a considerable amount of fine "slimes" may be incidentally produced. In such cases the second system of dressing must be resorted to, and the fine stuff, mixed with sufficient water to hold the particles freely in suspension, is worked upon one of the three following principles in order to separate and classify the *equal-falling* particles:

1st. In a horizontal stream of water of decreasing rapidity of current, and of sufficient depth, the heavier particles will first sink to the bottom, then lighter particles, and if the rapidity of the stream is properly regulated, the finest slimes will settle in the almost still water at the end of the apparatus.

2d. A vertically-ascending column of water of decreasing rapidity of current may be so regulated that it will carry, at first, all but the heaviest particles with it; afterward lighter particles will come to rest, and finally even the lightest will be able to overcome the action of the current, and by this means the different sorts may be separated.

3d. A comparatively shallow, smooth stream of water will allow the heavier particles to rest on the bottom of the trough, and as the rapidity of the current decreases, the lighter particles will also come to rest.

On each of these principles various kinds of apparatus have been constructed. The most economical in point of labor is one constructed on the first mentioned, and called in German a *spitz-kasten*, or pointed box. These boxes are hopper-shaped, built of wood, and a number of them of different sizes are connected, so that the stuff which collects in the bottom of each box will consist of equal-falling particles, possessed of different properties from those in any other box. Four boxes usually constitute one apparatus. The water carrying the ore flows into and over the

first box, the particles which are heavy or large enough settle in it, and the lighter or smaller ones flow on to the second, in which the heavier particles again settle, and so on to the third and fourth boxes. The rate at which the rapidity of the current diminishes is regulated mainly by the breadth of the boxes. Experience has shown that, for ordinary purposes, the relative breadth of the boxes should be in geometrical progression :

1, 2, 4, 8.

The first box, in which the heaviest and largest particles, about 0.04 inch in diameter, are to sink, must have one-tenth of a foot breadth for each cubic foot of the watery mixture to be dressed per minute. Hence when it is desired to dress 20 cubic feet per minute, the first box must be 2 feet wide. The relative widths of the boxes will then be—

2, 4, 8, 16 feet.

The length of the boxes varies usually in an arithmetical progression. To correspond with the above given widths the following lengths have been found by Rittinger to be most suitable:

6, 9, 12, 15 feet.

The sides of the boxes should have an inclination of at least 50° to the horizon. As the length of the boxes is usually greater than their width, care must be taken to have the least inclined side no nearer horizontal than the angle given, otherwise the fine stuff will sometimes collect in the corners, instead of sinking to the bottom, and cause irregularity in the discharge. On the other hand, it is unnecessary to make the sides steeper than 50° .

The size of the discharge opening must be regulated according to the height of the column of water in the box, so that only enough water passes to hold the solid particles in suspension. In case too much water escapes, a valve may be inserted in the discharge, and only opened at intervals.

The troughs to convey the water and ore to the apparatus should have 5 square inches sectional area for each cubic foot to be worked per minute, and they should be inclined from $\frac{1}{4}$ to $\frac{1}{24}$ of an inch per foot in length.

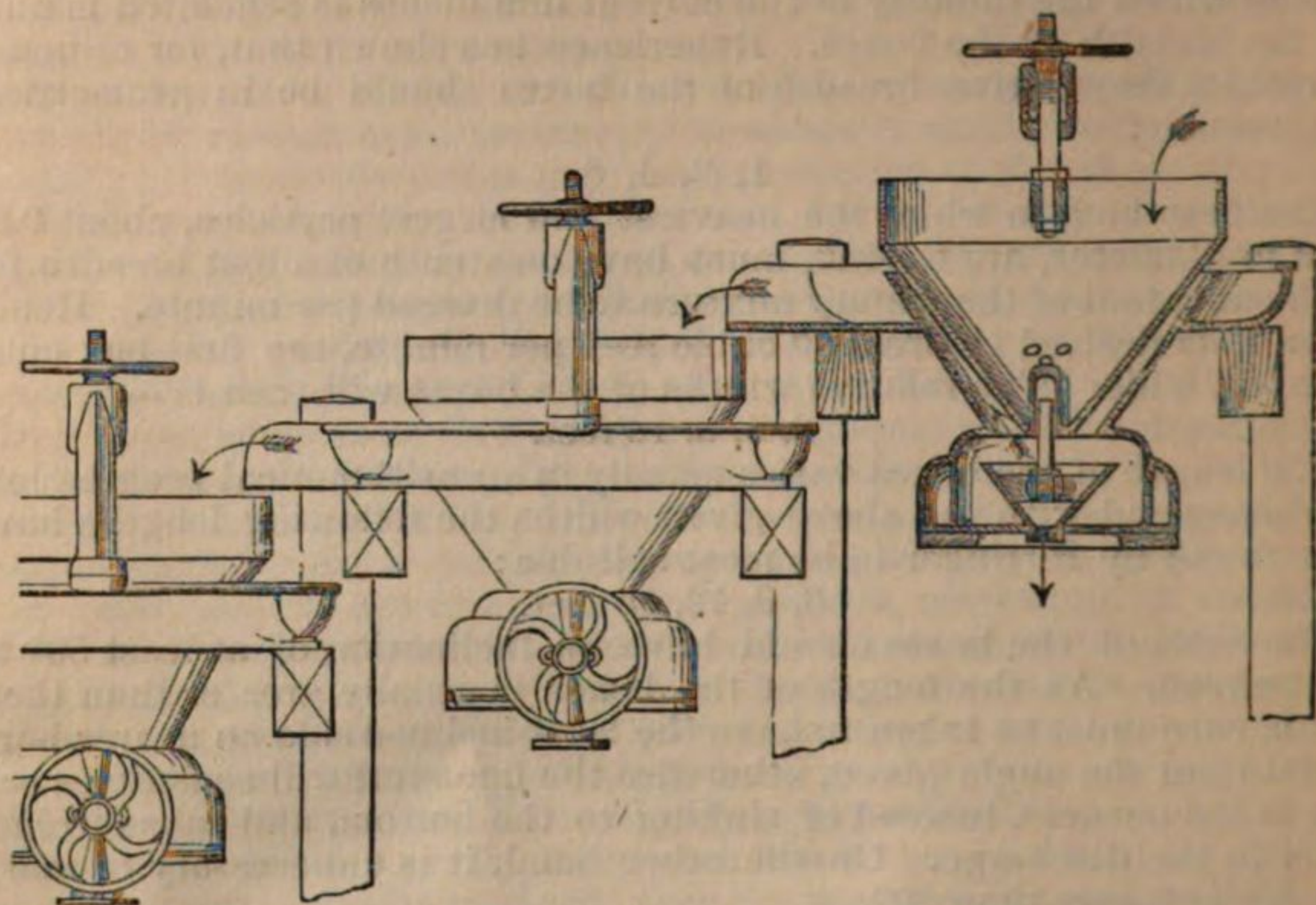
Considerable skill is necessary on the part of the builder of such an apparatus. The first box being the smallest is the easiest to construct.

The apparatus requires but little attention after it is once in successful operation, the only things to be observed being the feed and discharge. The size of the material which can be advantageously worked in this way varies from 0.04 inch to the finest slimes.

The second principle, involving the employment of an ascending current, has led to various modifications of the spitz-kasten. The most complete (but the most complicated) is perhaps the *spitz-lutten apparat*. This I shall not discuss. The two following machines, described by Professor Blake in the report already referred to, may be classed under this head.

An apparatus of conical form is shown here on a scale of $\frac{1}{25}$, the upper cone in section. A complete series is usually composed of five or six, arranged in succession, one below another, as shown. The construction is very simple; and they can be made of cast iron, so as to be very durable, and at the same time exact in form. Each part consists of two cones, one inserted in the other, so as to leave an annular space in which water flows upward from a reservoir or chamber at the lower or pointed end. The stuff to be concentrated is conveyed by a launder into the upper cone, and, passing through holes, encounters the upward current. The largest of the stuff so fed should not exceed three-quarters of a millimeter in diameter. The lighter portions are at once car-

ried upward and over the upper edge of the inner cone, and fall with the escape-water into an annular trough, by which they are conducted away to the next lower cone, while the particles of sufficient weight to



Conical separators.

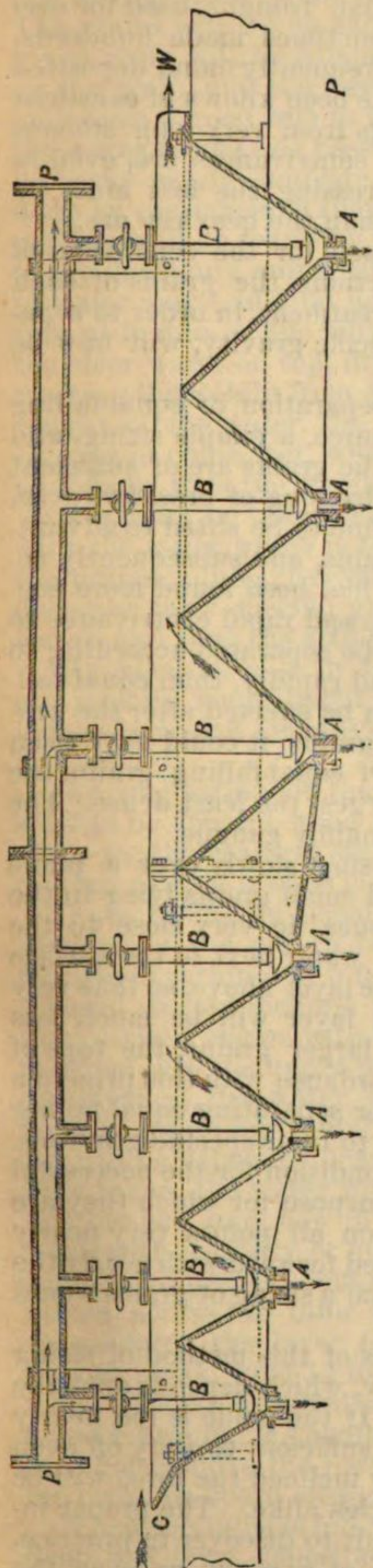
resist the current fall through it, and accumulate in a small inverted cone, in the chamber below, from which they are allowed to drop by the small aperture at the apex in the direction indicated by the arrow. This orifice is controlled by a valve, and can be regulated at will, according to the rapidity of the accumulation. So, also, by means of a screw above the upper cone, the distance between the cones can be regulated according to the necessities of each case. The apparatus requires considerable water, and the overflow from one cone is carried to the next, and so on in succession.

Separating tubs with ascending currents (*Spitzgerinne*) combine the principle of the flowing with that of the ascending currents. The machine here illustrated seems to be the apparatus of Rittinger, as improved by M. Bilharz, director at Altenberg, near Aix.

This form consists of a succession of deep trough-like depressions placed edge to edge, and gradually increasing in size and depth. But as the ends and sides are the highest, the series forms, in reality, but one vessel, the water covering all of the intermediate edges, and thus permitting a continuous flow from one end to the other. This will be seen from the inspection of the figure. Seven compartments, B B, are shown, and the direction of the flow from C to W is indicated. The whole series is supported upon a frame at such a height that the attendant can pass under it, and reach the openings at the apex of the pyramidal tubs, at A A, where the concentrated stuff flows out. A supply pipe, P P, delivers clear water into each compartment through a branch pipe reaching nearly to the bottom. The stuff entering at C deposits the heaviest particles, and, aided by the ascending flow of water from the pipe, the lighter portions pass over into the next tub, and so on. The flow of water into each compartment must be carefully regulated. As the size of the compartments increases, the ascending current

has less and less force, and finally only the very lightest and poorest portions are carried away.

The arrangement gives very satisfactory results. It requires from 120 to 150 quarts of water a minute, and will separate about a ton of battery-pulp in each hour. It may be constructed either of wood or of iron. The apparatus shown in the figure is made of iron.



Rittiger's separating-tubs with ascending currents.

On the third general principle above enumerated equal-falling particles may be separated in *inclined* troughs or sluices, through which the watery slimes are allowed to flow. The discharge of concentrated materials from such apparatus is not automatic, as American miners well know, being obliged to clean their sluices by hand. Launderers with riffles, blankets, &c., and ordinary tail-sluices, come under this head. When practicable I would always prefer to use the pointed-boxes just described. When troughs or sluices are employed, however, the inclination of the trough, and the quantity of water flowing on it, should be so regulated that as much of the worthless portion of the ore as possible will flow over the end without carrying with it any of the valuable portion which remains in the trough, and may afterward be removed and treated by itself. By widening the trough from the upper toward the lower end, the velocity of the current may be diminished so that a more perfect separation will take place. Care must, however, be taken that the stream flowing through the trough is not too shallow, for in that case the effect of the current would be to classify the grains according to specific gravity, instead of separating them into portions consisting of equal-falling grains.

The riffle, which is so frequently used in all gold-diggings, is constructed on this principle: The gold and coarse gravel collect in the riffle, and these are easily separated by washing in a pan after picking out the large pebbles by hand. Small cross-ribs are frequently nailed in the bottom of the riffle-box, partly to break up the even surface of the water, upon which fine gold may be floated off, and partly to serve as receptacles for the gold which has already sunk to the bottom, and prevent its being carried off in case the current becomes more rapid than it was when the particles were deposited.

The small pieces of gold, owing to their great specific gravity, soon

work their way through the coarser pieces of rock or gravel, which are deposited along with them, and are found usually on the very bottom.

A sluice is essentially the same as the German troughs used for ore-dressing. In gold-diggings the sluices are sometimes made hundreds, and even thousands, of feet long, and gold is frequently found deposited at the tail of the longest of them. Cases have been known of excellent profits being made by reworking the tailings from very long sluices, which would go to prove how imperfect these contrivances are, even in gold-washing. When they are used for ore-dressing the loss must be much greater, since gold is so much heavier than the heaviest ore.

The foregoing are the principal machines used for the separation of grains of different sizes and densities into portions, the grains of each of which are equal-falling. The subsequent treatment, in order to separate these different portions according to specific gravity, will now be considered.

The sizing of equal-falling particles.—The separation of equal-falling grains according to specific gravity is, of course, a simple sizing, and can be effected by the use of sieves, when the grains are of sufficient size to permit treatment. In the practical dressing of ores, however, only those portions of the ore which are too fine to be sifted to advantage are first separated into equal-falling grains, and subsequently according to specific gravity. Previous sizing has been found more economical, because the sieve is the most simple and rapid contrivance to effect the result, and because sized ore can be separated according to specific gravity more easily, economically, and rapidly, than equal-falling grains. If sizing by means of sieves can be effected after the separation according to the falling power of the grains, it could have been effected to better advantage beforehand. Of equal-falling grains the smallest are of course the densest, and the largest the least dense. The smaller grains will be mainly ore, the larger mainly gangue.

A very thin, smooth stream of water, passing slowly over a plane surface, exerts different forces upon large and small grains lying in the current. The highest points of the small ones lie very close to the plane surface. The friction on the layer of water next to the surface over which it runs is much greater than on the layer above, so that very small grains which lie wholly in the lowest layer will be much less acted on by the force of the current than larger grains, the tops of which protrude into the layer above. In accordance with this principle numerous machines have been constructed for separating equal-falling grains according to size, and hence according to their specific gravities. The thinness of the stream is a necessary condition for the successful operation of any of these machines for the purpose for which they are intended. A thick or deep stream acts upon all points very nearly equally, so that the small particles are propelled forward with nearly the same velocity as larger ones. In such a stream a sizing of grains would be impossible.

Another requisite condition for the success of this method of sizing is that the stream shall have the right velocity, which depends upon the inclination of the plane over which it flows. If the plane is too nearly horizontal the force of the current will not be sufficient to carry off even the coarser particles, and if it is too steeply inclined the force will be sufficient to sweep away fine and coarse particles alike. The proper inclination of the plane is, however, not difficult to discover in practice, and when the angle can be altered by means of a screw or lever, the proper adjustment is easily made.

The number of grains held in suspension in a given quantity of the water allowed to run on the plane, or, in other words, the muddiness of the stream, must also be regulated. If the water is too muddy it will not be free to act on the separate grains in the manner described above. The grains will act on each other, and the resultant force acting on a given grain will be composed of the force of the water-current acting on the grain, and the force imparted by the grains lying around it. It may seem a good rule to follow, in working with such machines, to have the water as clear as possible, since the sizing of the grains would then be most nearly complete; but on the other hand less work would be done by the machine than if the water were muddier. The economical medium will be found by practical experiments; it is in fact impossible to lay down any universal rule on the subject. The proportion of sand to water may easily be determined by catching a bucketful of the mixture as it runs on the table, weighing it, allowing it to settle, pouring off the clear water on top, drying the residue, weighing the same, and subtracting the weight from that of the original mixture. This will give the weight of the water, the amount of which it is frequently desirable to express in cubic feet, which is easily done by dividing the weight in pounds by 62.5, the weight of one cubic foot of water in pounds.

Care must be taken that the fine ore is already wet when it is mixed with the water which is to effect the sizing on the table. If it is dry, the grains will be enveloped with an adhering coating of air, which will decrease their specific gravity when they come to be mixed with the water, and thus the sizing process will be seriously interfered with.

The plane-table. — In Germany, according to Rittinger, such tables are usually made about 12 feet long, inclosed by sides from 12 to 15 inches high, and for convenience in working, not more than about 5 feet in width.

The inclination of these tables varies, according to the size of the stuff to be dressed upon them, from $2\frac{1}{2}$ degrees, for fine slimes, to 8 degrees for the coarsest stuff worked upon them. For dressing ores containing galena, a trifle more inclination may be given.

These tables are usually worked as follows: The water, carrying in suspension the ore to be dressed, is brought, by means of a pipe or trough, to within 4 or 5 feet of the head of the table, where it flows upon a board steeply inclined towards the table, but horizontal in the direction at right angles with the long axis of the table. By means of pegs fastened into the upper part of this board, or by some other convenient contrivance, the water is distributed uniformly over the board, and flows in a thin horizontal stream upon the table below. Soon a layer of ore will be deposited near the head of the table, and if no further care were taken, the water would in a short time cut furrows or channels in this ore-bed, and flow in a thick stream over the end of the table, carrying with it nearly or quite all of the solid matter held in suspension. In order to prevent this, a workman standing by the side, or on a board placed across the table and raised a few inches above it, smooths and consolidates the layer formed, by the use of a wire brush or piece of smooth plank, from 12 to 18 inches long, and about 3 inches broad, provided with a long handle. In this way he works over the whole table, always keeping a smooth, compact surface to the ore-bed, and taking care not to move the particles of ore up or down, but only to work with his brush or board straight across the table.

When the table is full, that is, when a layer of ore from 12 to 15 inches deep has been deposited over its surface, the water is shut off, and by means of a shovel the layer is divided into four parts, by lines cross-

ing the table parallel with the head. The first line is drawn at a point from the head of the table where the ore in the layer is decidedly richer than that originally fed upon the table; the second division is of about the same richness as the original material; the third is poorer, but still rich enough to pay for reworking; and the fourth is too poor to bear this expense, and is consequently rejected as worthless. Minor subdivisions may sometimes be made to advantage, but this will depend upon the richness of the ore, cost of the process of working, &c.

The apparatus employed in this process is neither complicated nor expensive, yet considerable manual labor is required to maintain the even surface of the layer, and to shovel out the different portions of ore from the bed. For this reason other machines have been employed to accomplish the same result. The most common of these are the buddle, called in German "*Rundheerd*," and the percussion-table, "*Stossheerd*." In each of these the tedious operation of maintaining by hand an even surface to the ore-layer is supplanted by mechanical contrivances.

The buddle.—This may be regarded as consisting of a large number of plane-tables, placed radially around a central point. They may be arranged with their heads together, the feed being in the center, and the discharge on the circumference, in which case the surface of the buddle will form the frustrum of a cone, or they may be grouped with tails toward the center, the feed being on the circumference, and the discharge in the center, in which case the surface of the buddle will form an inverted frustrum of a cone.

A buddle of the first kind is shown in the accompanying figure. The watery slime coming through the trough *r*, enters the funnel-shaped receptacle *c*, and through suitable openings passes over the conical surface *h*, and thence up on the bed of the buddle *a a*. The vertical central shaft *s* receives, by means of bevel-gear *t*, a rotary motion from the shaft *s*.

The arms *d* and the receptacle *c* are in connection with the revolving shaft *s*. In the arms *d* are attached the rollers *n n* and *n' n'*, which are provided with cranks and catches.

To these are attached the brushes *f f* and *f' f'*, which serve to smooth and consolidate the ore on the buddle.

The circumference of the buddle is inclosed by the wooden partition *a'*, 12 inches high, which is provided with round holes at different heights. These holes are successively closed with wooden stoppers as the layer of ore rises on the surface of the buddle.

Instead of brushes attached to the pieces *f f* and *f' f'*, canvas cloths are frequently used with good effect for the same purpose.

The diameter of the outer circle of the buddle represented is 20 feet, and that of the conical table in the center 6 feet, so that the length of the conical surface over which flows the material to be dressed is 7 feet.

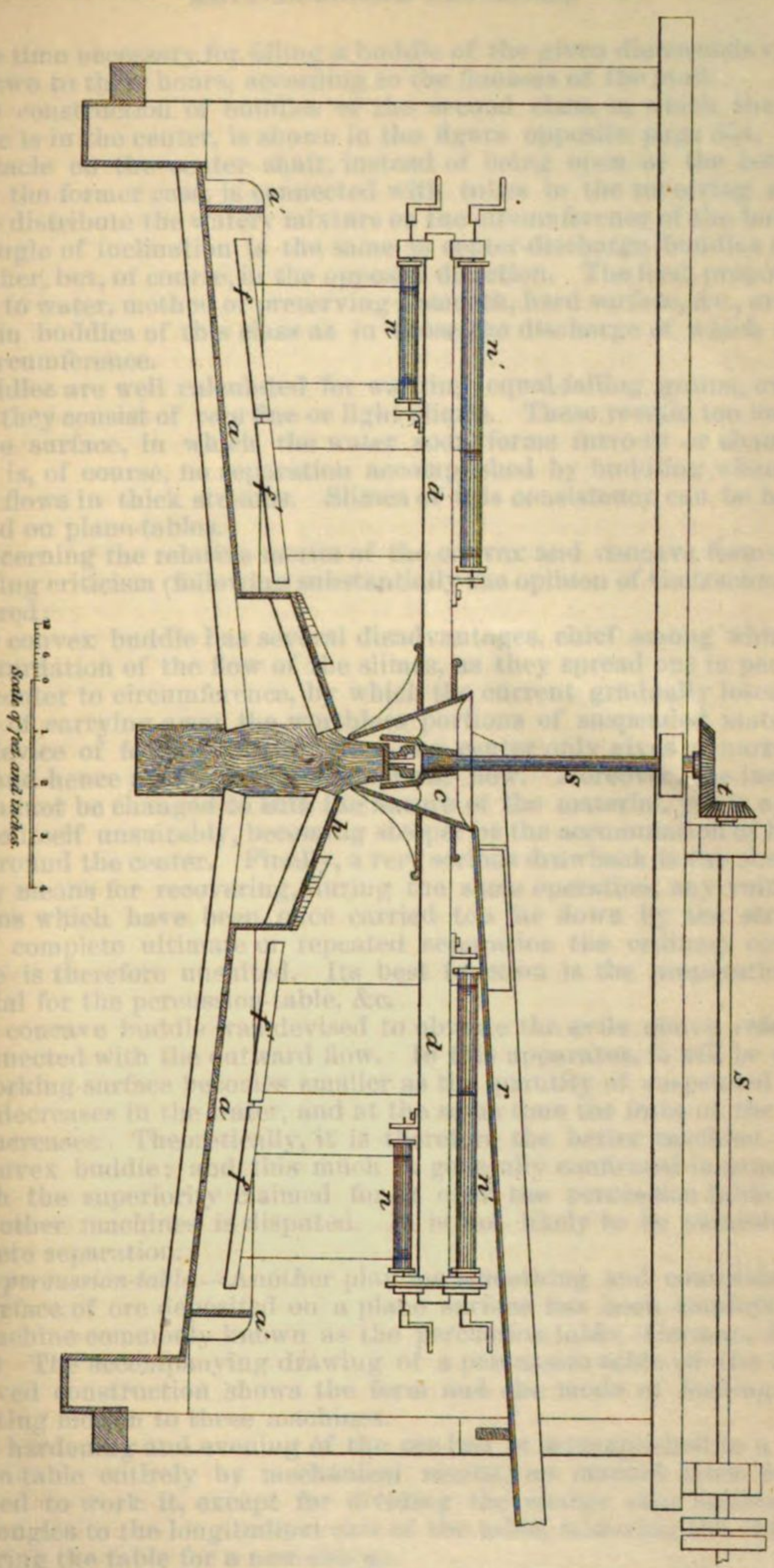
The central shaft should make from ten to twelve revolutions per minute. It requires but very little power to drive it. Rittinger estimates the force required at a twentieth of one horse-power.

The rollers *n n* and *n' n'* serve to regulate the position of the wooden bars *f f* and *f' f'* which carry the brushes or cloths.

The water flowing on the buddle should carry from 40 to 60 pounds of fine ore to the cubic foot, and from 2 to 3 cubic feet of it should be allowed to flow on the buddle per minute.

The inclination of the surface of the buddle should be such that the outer edge is from 4 to 8 inches lower than the inner circle, where it is fed. The inclination varies with the fineness of the ore treated, it being, of course, greater for coarse stuff than for fine.

THE CONVEX BUDDLE.



The time necessary for filling a buddle of the given dimensions varies from two to three hours, according to the fineness of the stuff.

The construction of buddles of the second class, in which the discharge is in the center, is shown in the figure opposite page 334. The receptacle on the center shaft, instead of being open at the bottom, as in the former case, is connected with tubes in the revolving arms, which distribute the watery mixture on the circumference of the buddle. The angle of inclination is the same in center-discharge buddles as in the other, but, of course, in the opposite direction. The feed, proportion of ore to water, method of preserving a smooth, hard surface, &c., are the same in buddles of this class as in those the discharge of which is on the circumference.

Buddles are well calculated for washing equal-falling grains, except when they consist of *very* fine or light slimes. These remain too loosely on the surface, in which the water soon forms furrows or channels. There is, of course, no separation accomplished by buddling when the water flows in thick streams. Slimes of this consistency can be better treated on plane-tables.

Concerning the relative merits of the convex and concave forms, the following criticism (following substantially the opinion of Gætzschmann) is offered:

The convex buddle has several disadvantages, chief among which is the retardation of the flow of the slimes, as they spread out in passing from center to circumference, by which the current gradually loses the power of carrying away the worthless portions of suspended material. The device of feeding farther from the center only gives a narrower ring, and hence a shorter distance for the flow. Moreover, the inclination cannot be changed to suit the nature of the material, yet is apt to change itself unsuitably, becoming steeper by the accumulation of headings around the center. Finally, a very serious drawback is the absence of any means for recovering, during the same operation, any valuable portions which have been once carried too far down by the stream. For a complete ultimate or repeated separation the ordinary convex buddle is therefore unsuited. Its best function is the preparation of material for the percussion-table, &c.

The concave buddle was devised to obviate the evils above referred to, connected with the outward flow. In this apparatus, it will be seen, the working-surface becomes smaller as the quantity of suspended material decreases in the water, and at the same time the force of the current increases. Theoretically, it is therefore the better machine than the convex buddle; and this much is generally confirmed in practice, though the superiority claimed for it over the percussion-table and some other machines is disputed. It is not likely to be suitable for complete separation.

The percussion-table.—Another plan for smoothing and consolidating the surface of ore deposited on a plane surface has been employed in the machine commonly known as the percussion-table, (German, *Stoss-heerd*.) The accompanying drawing of a percussion-table of the most approved construction shows the form and the mode of feeding and imparting motion to these machines.

The hardening and evening of the ore-bed is accomplished in a percussion-table entirely by mechanical means, no manual labor being required to work it, except for dividing the charge into sections at right angles to the longitudinal axis of the table, removing the old and preparing the table for a new charge.

In discussing the buddle, I have already alluded to the difficulty of

consolidating the layer of ore, especially when the particles composing it are very small. In the percussion-table the shock given to the table is imparted to the particles, so that even the finer particles which remain loose on the buddle, and which have to be stamped or pressed down by hand on the plane table, are thoroughly shaken together and consolidated by mechanical means on the percussion-table.

The blow imparted to the percussion table could be caused by striking the movable table with a moving weight, but it is ordinarily given by suspending the table, swinging it from its position of equilibrium and allowing its backward swing to be stopped by striking against a stationary object. The blow may be imparted to the end or to the side of the table. In the present connection I shall only consider machines of the first class. Machines employing the side-blow will be mentioned under the head of continuous percussion tables. The heaping up of the ore on the side renders them unsuitable for use as intermittently working machines.

By reference to the drawing, the operation of sizing equal-falling grains on a percussion table will be easily understood. The ore is fed, in the first place, into the box *u*, at the head of the table, and thoroughly mixed with water, which flows upon it through the stop-cocks shown immediately above it. The water carrying the ore flows over the board *s*, and is evenly distributed in a thin stream over its surface by means of a row of stout wooden pegs. In this condition the water flows upon the board *h* attached to the head of the percussion table, and from which it flows upon the table itself, which is usually made 12 feet long and 5 feet broad. Three longitudinal and three cross pieces enter into the construction of the frame for the table. The boards composing the floor are not tongued and grooved, but simply driven up close with a hammer and nailed fast, after a strip of lamp-wick has been laid between them. The lumber need not be more than about half seasoned, as shrinkage is not to be feared when the table is wet, and the expansion of perfectly dry wood might be sufficient to twist and "buckle up" the floor.

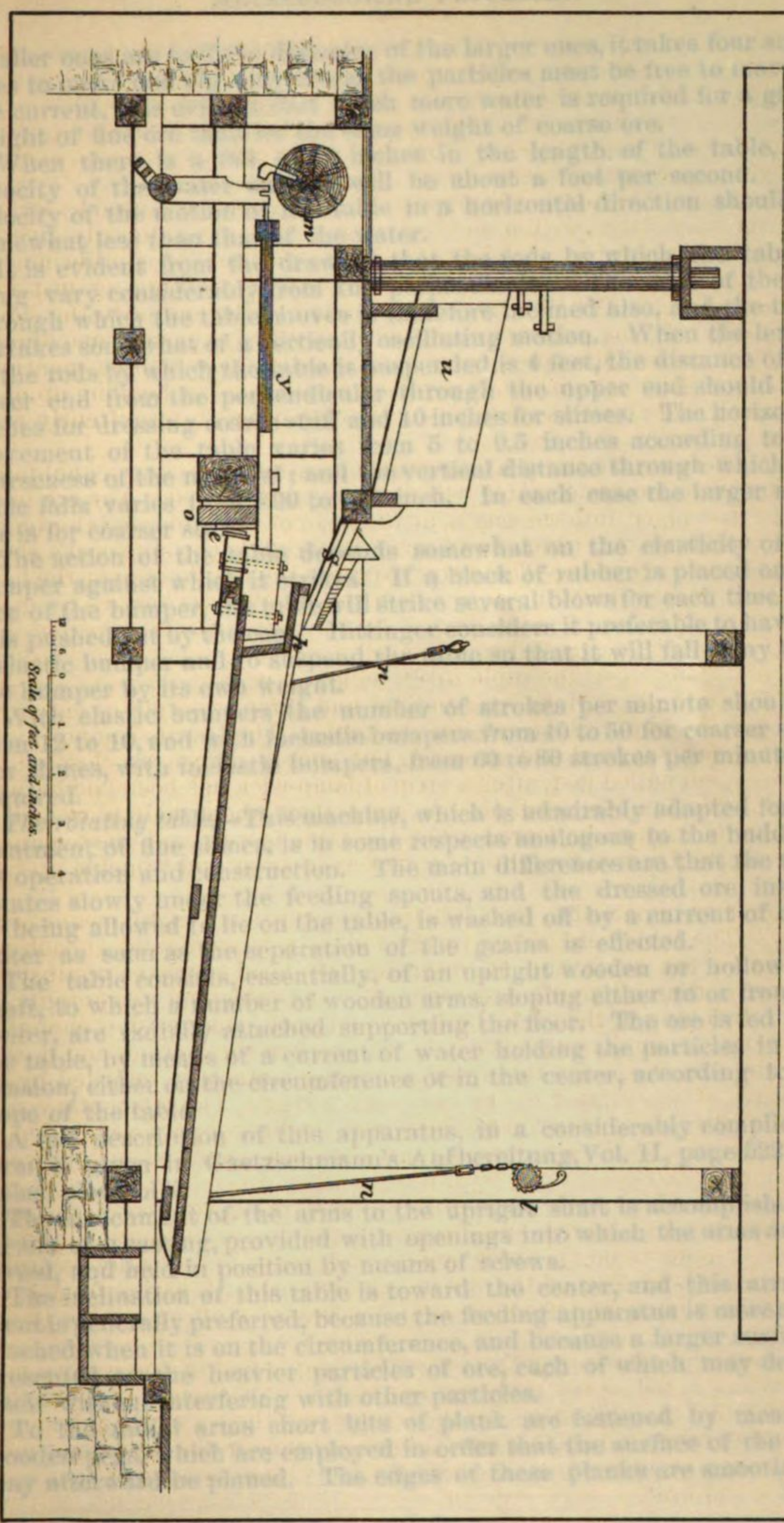
Motion is imparted to the table from the cam-shaft *m*, by means of the rod *y*. The table being hung by the rods *n n*, is swung out at each revolution of the shaft, and on returning the head *e* strikes against the bumper *o*, thereby giving a sudden jar to the table and its contents.

The swinging of the table, both out and back, must be slow enough to allow the stream passing over it to take part in the motion, and flow on over the surface of the table without being materially retarded by the outward, or accelerated by the backward swing. The momentary stoppage of so shallow a stream would permit the lighter particles to deposit themselves in the ore-layer at one time, and the accelerated current would carry heavy particles along with it at another time.

By means of a long lever and the roller *l*, the lower end of the table can be raised or lowered, so as to give it the proper inclination, and the current proper velocity, which must be determined practically according to the kind and size of the ore being dressed. It varies from 4 to 6 inches for slimes, and from 10 to 16 for coarse stuff, in a table 12 feet long.

In dressing coarse stuff from 0.5 to 0.7 cubic foot of the watery mixture of ore is fed on the table per minute; and of slimes not more than from 0.1 to 0.14 cubic foot. In the former case the water should contain from 20 to 40 pounds of ore per cubic foot, and in the latter, not more than from 5 to 10 pounds. A comparatively large number of small particles is required to make up the weight of one large particle. If the

THE PERCUSSION TABLE.



consolidating the layer of ore, especially when the particles composing it are very small. In the present case, the particles are of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated.

The blow imparted to the particles is caused by striking the table with a moving weight. The weight is ordinarily given by a spring, which is attached to the table, and is allowed to move up and down. The weight is, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated.

By reference to the drawing, the operation of the machine is easily understood. The ore is placed in a hopper, and falls into a box, at the bottom of which is a layer of water. The water is, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated.

Water is imparted to the table, and the particles are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated.

The striking of the table, both in front and back, is, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated.

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The weight is, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated. The particles are, however, of the size of small pebbles, and are, therefore, not so easily consolidated.

smaller ones are half the diameter of the larger ones, it takes four small ones to make one big one, and as the particles must be free to move in the current, it is evident that much more water is required for a given weight of fine ore than for the same weight of coarse ore.

When there is a fall of 12 inches in the length of the table, the velocity of the water current will be about a foot per second. The velocity of the motion of the table in a horizontal direction should be somewhat less than that of the water.

It is evident from the drawing that the rods by which the table is hung vary considerably from the perpendicular. The cord of the arc through which the table moves is therefore inclined also, and the table partakes somewhat of a vertically oscillating motion. When the length of the rods by which the table is suspended is 4 feet, the distance of the lower end from the perpendicular through the upper end should be 6 inches for dressing coarse stuff and 10 inches for slimes. The horizontal movement of the table varies from 5 to 0.5 inches according to the coarseness of the material; and the vertical distance through which the table falls varies from 0.90 to 0.11 inch. In each case the larger number is for coarser stuff.

The action of the table depends somewhat on the elasticity of the bumper against which it strikes. If a block of rubber is placed on the face of the bumper, the table will strike several blows for each time that it is pushed out by the cam. Rittinger considers it preferable to have an inelastic bumper and to suspend the table so that it will fall away from the bumper by its own weight.

With elastic bumpers the number of strokes per minute should be from 12 to 16, and with inelastic bumpers from 40 to 50 for coarser stuff. For slimes, with inelastic bumpers, from 60 to 80 strokes per minute are required.

The rotating table.—This machine, which is admirably adapted for the treatment of fine slimes, is in some respects analogous to the buddle in its operation and construction. The main differences are that the table rotates slowly under the feeding spouts, and the dressed ore, instead of being allowed to lie on the table, is washed off by a current of clean water as soon as the separation of the grains is effected.

The table consists, essentially, of an upright wooden or hollow iron shaft, to which a number of wooden arms, sloping either to or from the center, are radially attached supporting the floor. The ore is fed upon the table, by means of a current of water holding the particles in suspension, either on the circumference or in the center, according to the slope of the table.

A full description of this apparatus, in a considerably complicated form, is given in Gaetzschmann's *Aufbereitung*, Vol. II, page 522, and Atlas, plate LIX.

The attachment of the arms to the upright shaft is accomplished by means of a casting, provided with openings into which the arms are inserted, and held in position by means of screws.

The inclination of this table is toward the center, and this arrangement is generally preferred, because the feeding apparatus is more easily reached when it is on the circumference, and because a larger surface is presented to the heavier particles of ore, each of which may deposit itself without interfering with other particles.

To the radial arms short bits of plank are fastened by means of wooden pegs, which are employed in order that the surface of the table may afterward be planed. The edges of these planks are smooth, and

the joints are made tight by laying a piece of string or lampwick between them, and driving them up tight together before securing them by the pegs. The exterior diameter of the table is 16 feet, and in the center a circular space, 5 feet in diameter, is left open. Around the circumference of this circle is the discharge.

For treating fine slimes the inclination of the table should be 6 inches in $5\frac{1}{2}$ feet, or an angle of $5^{\circ} 10'$ with the horizontal plane. After a smooth surface has been obtained for the table, a number of small strips of wood (from 32 to 64) are nailed radially upon it, so as to divide the table into sections.

The watery mixture of ore is fed upon the table by means of feeding-boards, which are so constructed as to cause the mixture to flow in a thin even stream. These boards are inclined at an angle of 20° and their lower end is as broad as two of the sections on the table.

The table is revolved very slowly, making only about six revolutions per hour, or one revolution in ten minutes.

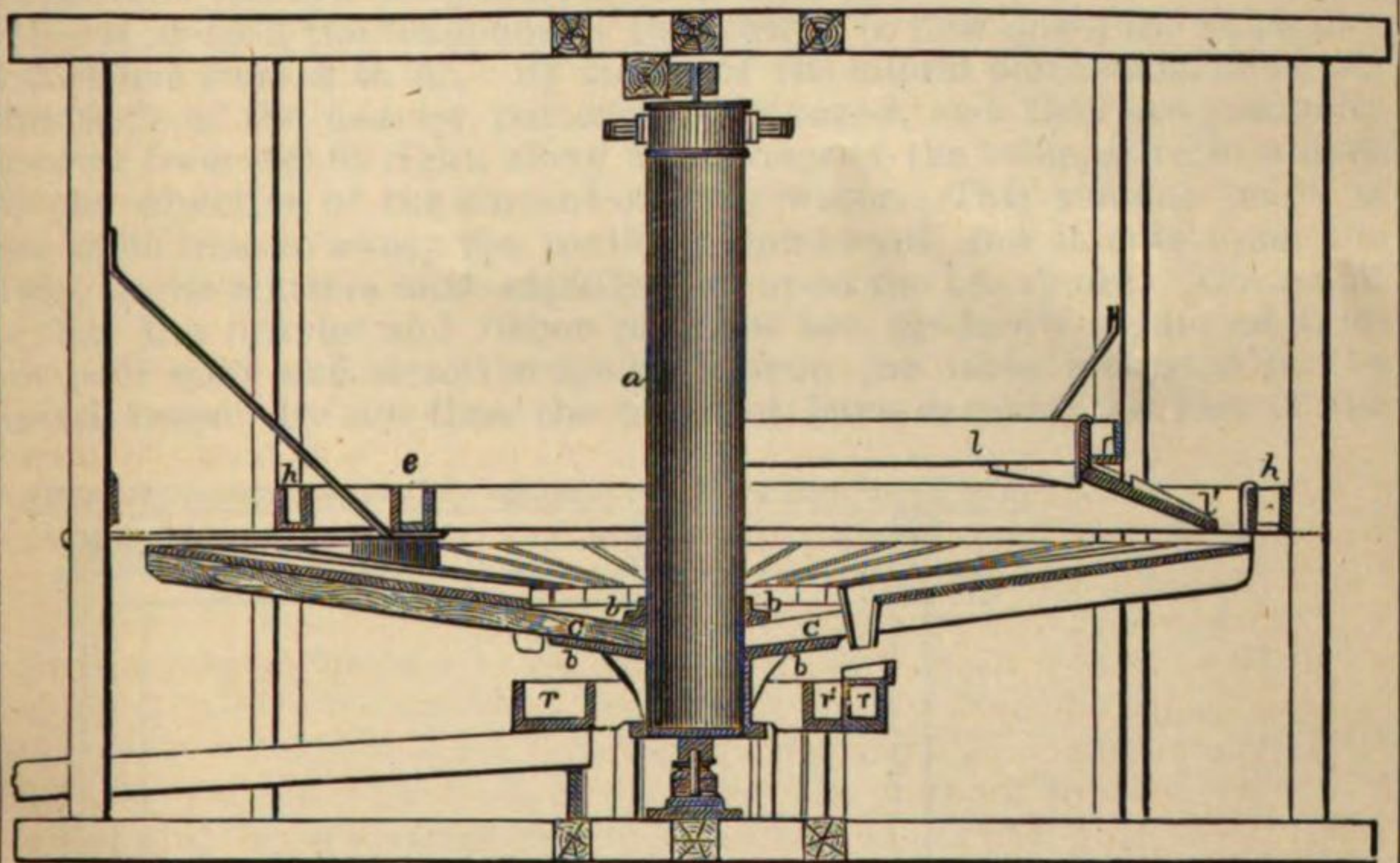
There are four feeding-boards, which are of course stationary, and from each of which flows a continuous stream. The motion of the table is so slow that by the time the sections which were fed from the first feeding-board come under the second, the larger and lighter particles have been washed over the table, and into the circular trough *r*, situated beneath it, whence they are conveyed by suitable conduits. The same operation is repeated at each of the other feeding-boards, and the heavy particles which were deposited upon the table from the first feeding-board, together with similar particles from the other boards remain upon it till it is revolved past the last board.

Clear water is added in a stream sufficiently strong to wash the table clear of everything except the heaviest particles, which are finally washed off from each section when it reaches a certain point by means of a small flat stream of water under considerable pressure. Rittinger claimed in 1867 the following advantages for this machine, as compared with the percussion-table:

1. The rotary-table furnishes at once a clean product.
2. The concentration of a given quantity of watery mixture of ore is more rapidly effected.
3. The yield is 5 to 6 per cent. greater.
4. The costs of tending and driving the rotating-table are less than for a percussion-table. The power required to drive a rotating-table is very small, not over $\frac{1}{10}$ of a horse-power. When the table is once in good operation, but very little attention is required to keep it in that condition. Rittinger says that one boy can be placed in charge of several such tables.

It should be added that Rittinger is rather enthusiastic upon the subject of this apparatus, and that later practice has not altogether confirmed the opinion above quoted, expressed by him in 1867. At Clausthal, Freiberg, and even at Przibram, the results of experiment with it have not been entirely satisfactory. The principal trouble appears to have been a choking of the compartments at their lower and narrow ends. An extra circular trough, delivering water at these points, was found necessary but not altogether effective; and other remedies complicated the machine. Moreover, the consumption of water is said to have been inevitably very great. Gaetzschmann praises the principle, but thinks further improvements in form necessary.

The continuous percussion table.—The working of the ordinary percussion table is necessarily intermitted, in order to remove from the table the ore which has accumulated upon it. Such tables had been used for



Rotating table. [See pp. 457, 458.]

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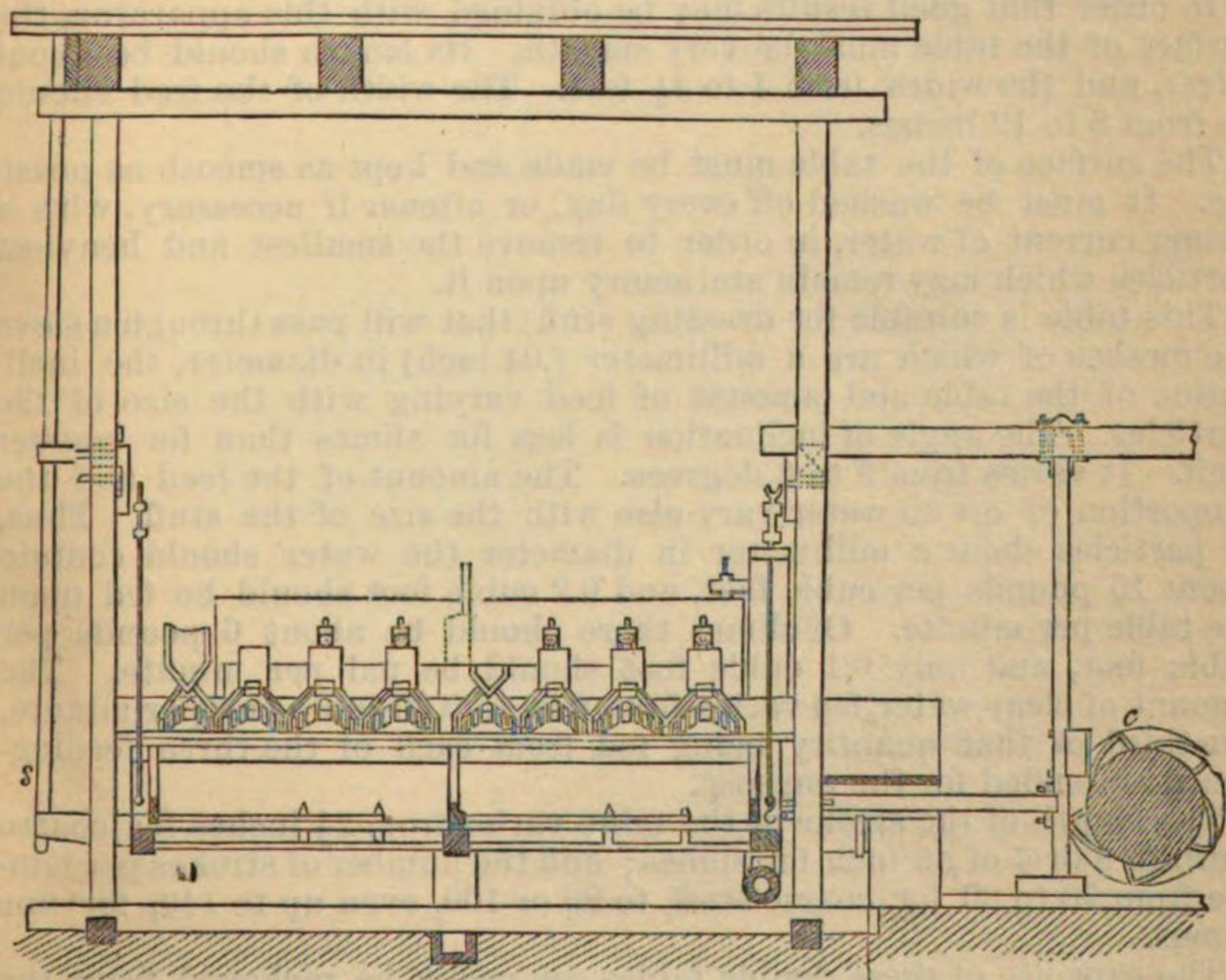


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many years before a continuous table was constructed, which presents the advantages of doing more work in a given time, furnishing a cleaner product, and requiring less attention and less manual labor than the old-fashioned machine.

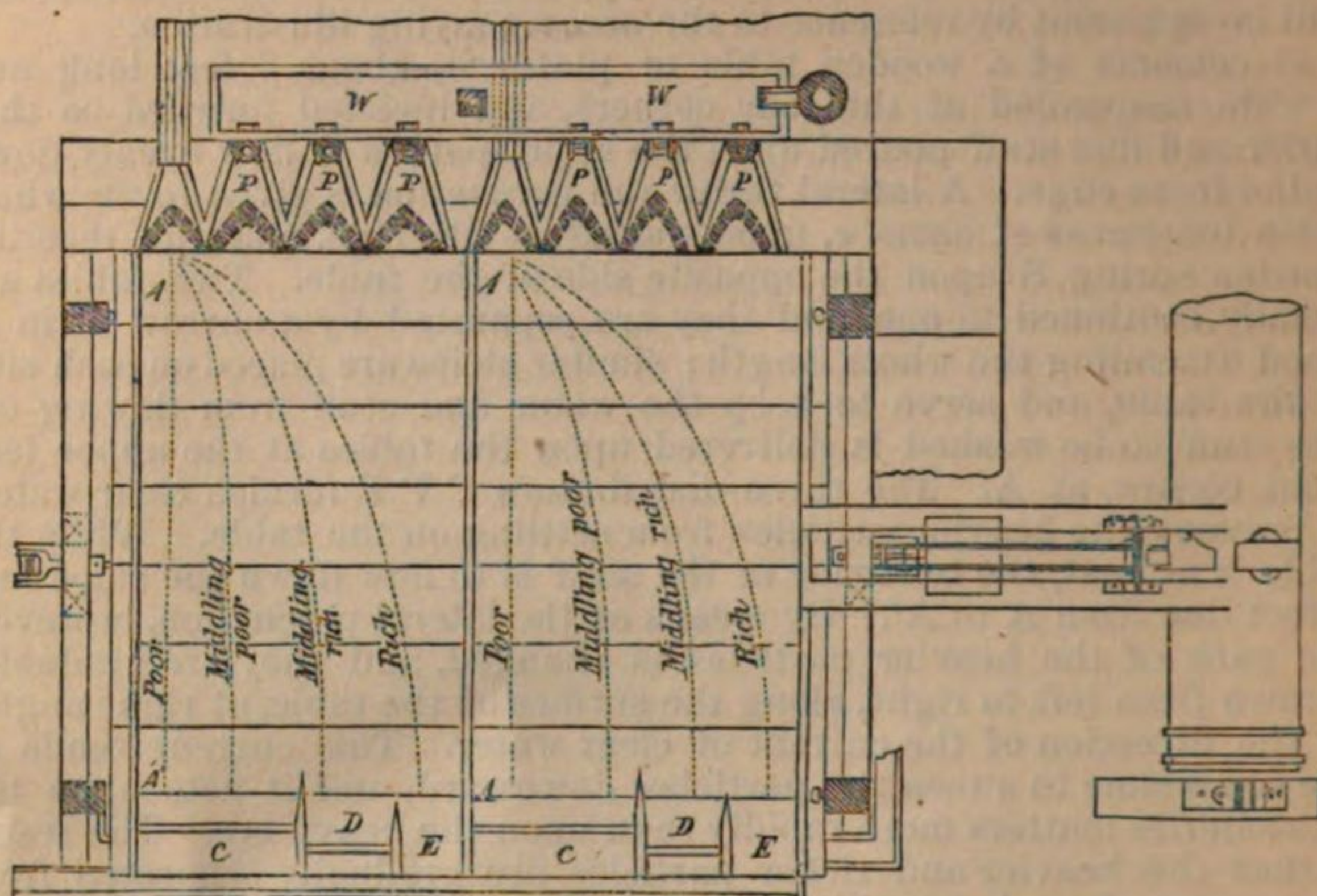
The construction and manner of operation of the continuous table will be apparent by reference to the accompanying illustration.

It consists of a wooden table or platform, about 8 feet long and 4 wide, suspended at the four corners, and inclined forward so that water and fine stuff poured upon the upper part will flow evenly down to the front edge. A lateral throw and percussion is given to the whole table by means of cams, *c*, upon a shaft at the side, and the reacting wooden spring *S* upon the opposite side of the table. Two tables are usually combined in one, and they are separated by a narrow strip of wood extending the whole length; similar strips are placed on each side of the table, and serve to keep the water and stuff from flowing off. The stuff to be washed is delivered upon the tables at the upper left-hand corner, at *A*. The three distributors *P P P* furnish clear water, to prevent the heavier particles from settling on the table. While the table is at rest, the tendency of the stuff is to flow down the slope in a direct line from *A* to *A'*. By means of the lateral percussion, however, the path of the heavier particles is changed, and they are gradually thrown from left to right, along the surface of the table, at right angles to the direction of the current of clear water. This current tends at the same time to sweep the particles downward, and it acts upon the light sterile matters more rapidly than upon the heavy ore. The result is that the heavier and richer particles are gradually separated from the poor stuff and describe the path upon the table indicated by the dotted lines. By the time the particles have reached the foot of the



Rittinger's Continuously-working Stossheerd—front view.

table, the richest portions have been transferred to the corner of the table diagonally opposite to that upon which the stuff entered, and they flow off into the compartment E. The "middlings" are dropped into the next compartment D, and the poor falls into C.



Ritinger's Continuously-working Stossheerd—view from above.

In order that good results may be obtained with this apparatus, the surface of the table must be very smooth. Its length should be about 8 feet, and the width from 4 to 4½ feet. The width of the feed should be from 8 to 12 inches.

The surface of the table must be made and kept as smooth as possible. It must be washed off every day, or oftener if necessary, with a strong current of water, in order to remove the smallest and heaviest particles which may remain stationary upon it.

This table is suitable for dressing stuff that will pass through a sieve the meshes of which are a millimeter (.04 inch) in diameter, the inclination of the table and amount of feed varying with the size of the particles. The angle of inclination is less for slimes than for coarser stuff. It varies from 3 to 6 degrees. The amount of the feed and the proportion of ore to water vary also with the size of the stuff. Thus, of particles about a millimeter in diameter the water should contain about 15 pounds per cubic foot, and 0.2 cubic foot should be fed upon the table per minute. Of slimes there should be about 6 pounds per cubic foot, and only 0.1 cubic foot should be fed per minute. The amount of clear water fed varies from 0.60 to 0.36 cubic foot per minute, one-third of that quantity being fed from each of the three feeding-boards intended for the purpose.

The length of the stroke of the table varies from 2½ inches for coarse stuff, to ½ or ¾ of an inch for slimes; and the number of strokes per minute from 70 to 80 for coarse stuff, to 90 or 100, even up to 140, for fine slimes.

The capacity of these double tables can easily be reckoned from the above data. It varies from 10 tons to 1 ton in twenty-four hours, according to the size of the stuff treated.

About a quarter of a horse-power is required to drive one of these tables.

When four tables, or a pair of double tables, are worked at the same time, the watery mixture of ore from the pointed boxes should be fed on three of the tables, while upon the fourth the product of the other tables too rich to throw away, and too poor to be sent to the smelting works, is reworked.

The ore produced by these tables is remarkably free from gangue. That which reaches the foot of the table at the extreme right hand is almost perfectly clean. Going to the left the proportion of gangue increases very rapidly, so that it is not at all difficult to adjust the strip at the bottom of the table in such a way that the ore from the right-hand division will be free from gangue; that from the left free from ore, and the middle division only furnish a product requiring to be reworked. Rittinger says that in Germany the cost of dressing ore on the continuous table is only about half that of the same work on the ordinary percussion table. In this country the difference would be still greater, on account of the higher price of labor.

PART III.

MISCELLANEOUS.

PART III.

MISCELLANEOUS

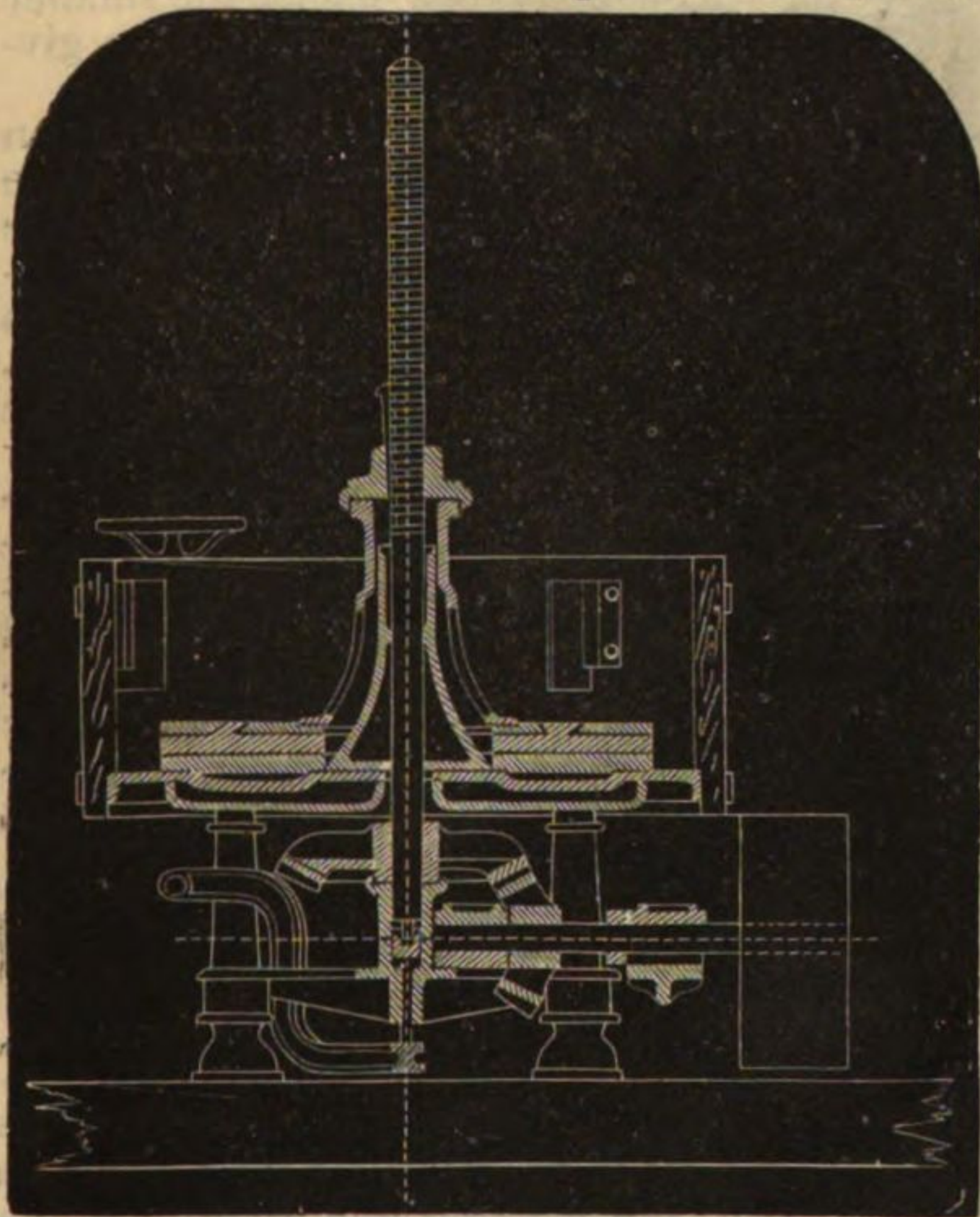
CHAPTER XIX.

MINING-MACHINERY.

The subject of the mechanical appliances of mining, so ably discussed by Professor Blake in a former report, cannot be further treated in detail within the compass of the present volume. I have thought it well, however, to insert in this chapter a series of engravings, illustrating the present approved patterns, in several important departments of mining and metallurgy, as developed in the practice of the Pacific States and Territories. The illustrations are taken from the very handsome pictorial catalogue of H. J. Booth & Co., of San Francisco, who have courteously placed the electrotypes at my disposal.

THE WHEELER PAN.

This pan is one of the oldest in use, having been first introduced in 1862. The cut shows an improved form. It is made with a flat bottom

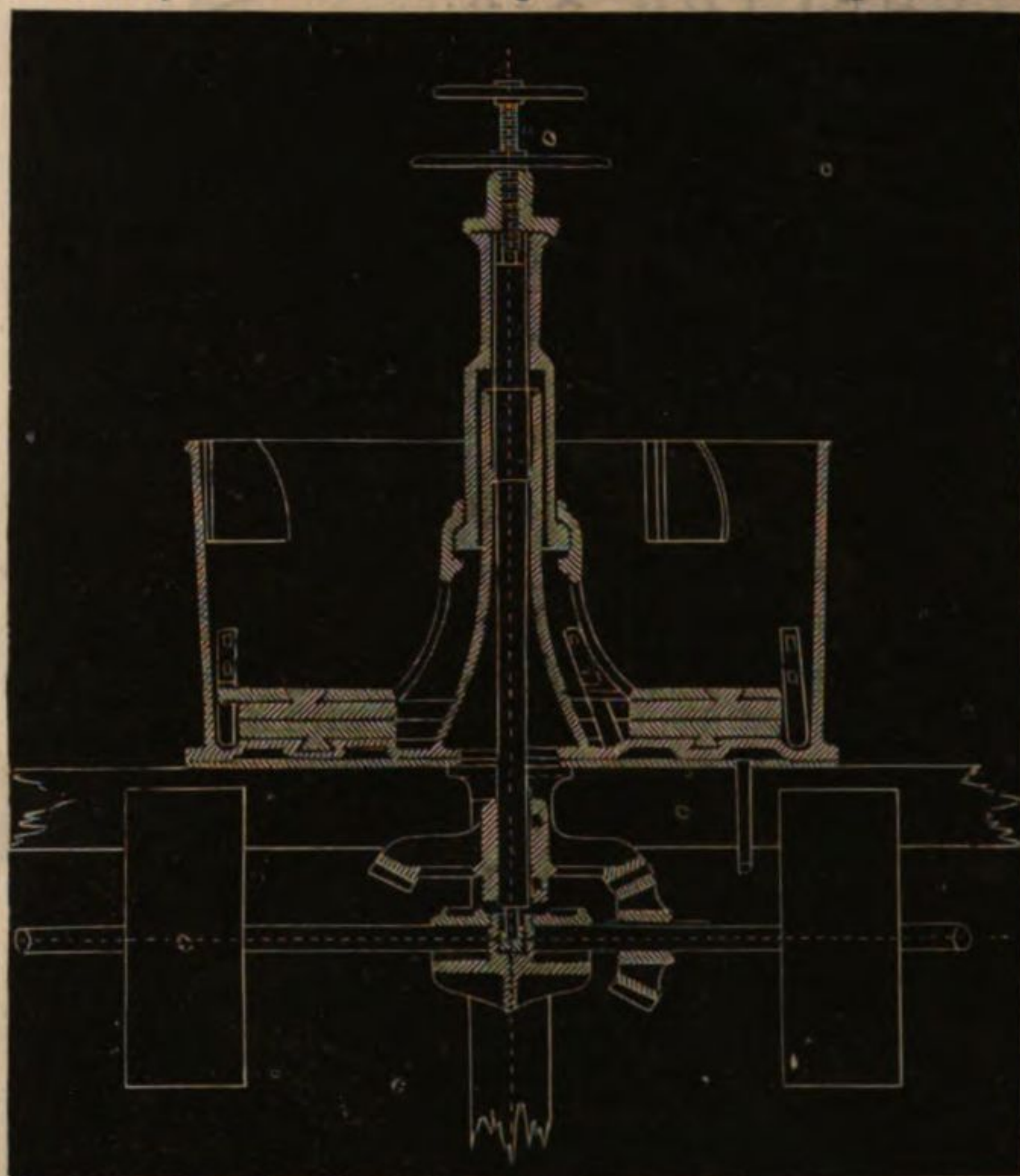


to which the dies are secured by dove-tailed tongues and sockets. The shoes are attached to the muller-plate in a similar way. The muller is carried by a vertical shaft, passing up through the cone in the middle of the pan, and is raised up for the purpose of cleaning the pan by a screw cut on the shaft. In working the shaft is prevented by a key from turning in the nut of the muller. The regulation of the distance of the shoe and die from one another, in working, is accomplished by a hand wheel at the side of the pan, which, through a lever, raises or lowers the steel block, into which the toe of the up-

right shaft steps. Bevel-gearing transmits the motion to the vertical shaft, from the horizontal shaft, which has a pulley on its outer end. A steam-bottom is fastened to the bottom of the pan, so that the contents of the pan may be heated. The sides may be either of wood, cast-iron, or sheet-iron.

THE HORN PAN.

This pan, like the Wheeler, described above, has a flat bottom. The tendency of the western practice is to adopt the flat bottom, in prefer-



ence to the conical or concave forms. The "tractory conoidal" form of the Wheeler and Randall pans is used by many operators where grinding as well as amalgamating is desired; but its alleged advantages are purchased at the cost of some drawbacks, among which may be named the smaller capacity for a given diameter.

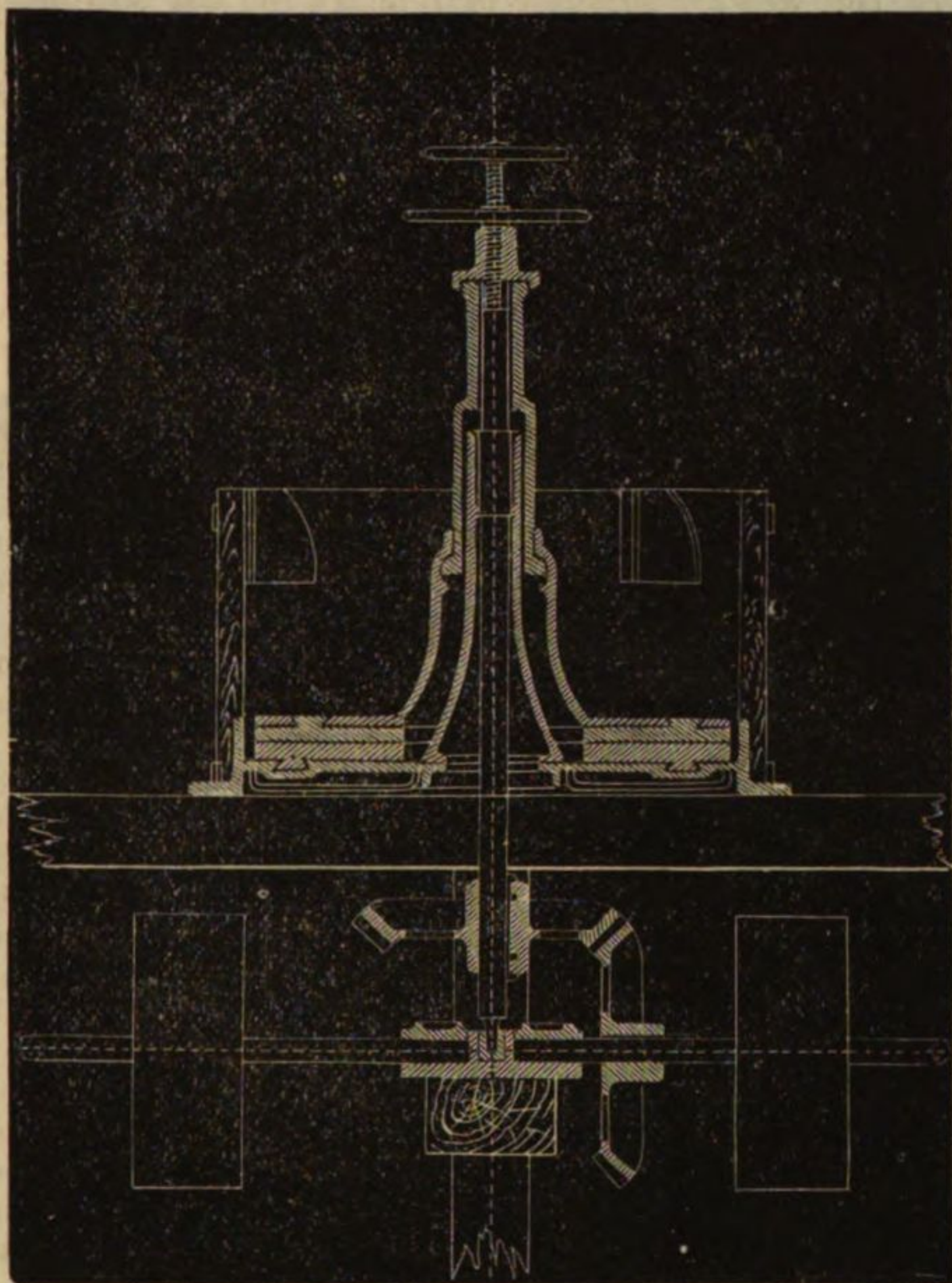
In the Horn pan, a flat plate serves the double purpose of a foundation and a steam-bottom. The body of the pan is set directly

upon this, and the joint is made with cement. The shoes and dies are secured by dovetailed tongues and sockets. A groove runs around the pan, outside the circumference of the muller, which is traversed by a scraper, fastened to the muller. The gutter around the cone is also scraped in the same way. The muller is hung loose upon the driver, which is carried by the vertical shaft, and is regulated as to height by the screw at the top, the point of which rests upon the top of the shaft. A yoke is fastened to the bottom of the pan, which serves for a footstep, and also carries the bearing for the horizontal-motion shaft.

THE PATTON PAN.

This is in some respects a compound of the Wheeler and the Horn, resembling rather the second than the first. The steam-bottom is fastened beneath, as in the Wheeler pan, and the yoke, which in the Horn pan serves for a footstep and also carries the bearing for the horizontal driving-shaft, is here dispensed with, the footstep and shaft-bearings being set upon the wooden framing of the mill which carries the pans. The manner of hanging the muller loose upon the driver, which is carried by a vertical shaft and regulated in height by a screw at the top, is the same as in the Horn pan; and the attachment of the dies to the bottom, and of the shoes to the muller, by means of dovetailed tongues and sockets, is the same as in both the Wheeler and the Horn pans;

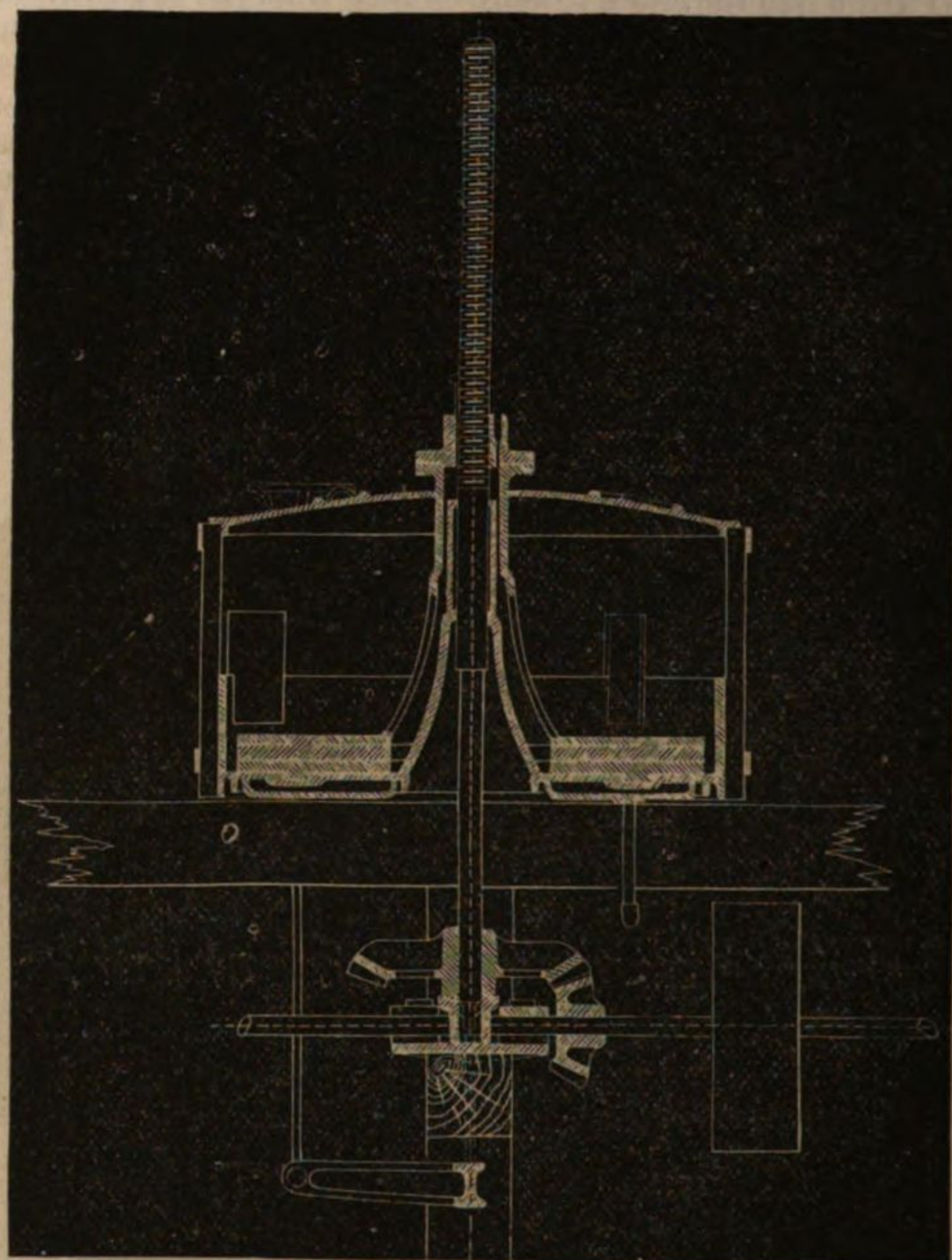
but in the Patton pan the sides, as may be seen from the illustration, are made of wood. It will be noticed that in all these pans, as manufac-



tured by the Union Iron-Works of San Francisco, there are curved flanges extending inward from the upper part of the side. The form of these, as shown in the drawings, is slightly different in the two latter pans from what it is in the former. They are intended to effect a circulation of the pulp, and it is claimed that the warped surface adopted in the pan herewith illustrated, does this most satisfactorily.

THE COMBINATION PAN.

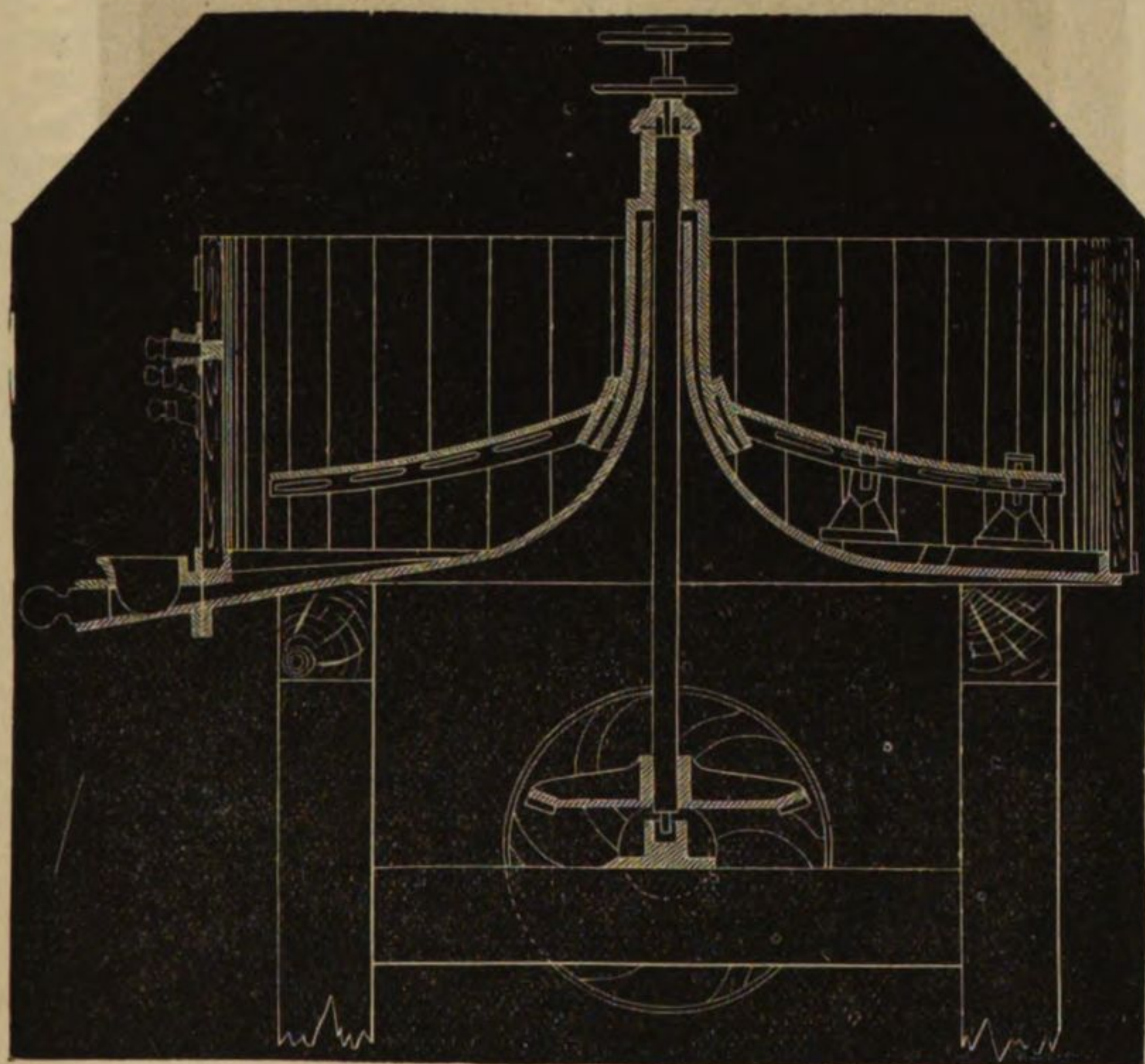
This is the Wheeler pan with the Patton footstep, the only thing of its own being a cast-iron ring set in the pan to protect the wooden sides. This ring can be replaced when worn. This machine is one of the latest and most approved forms. It is noteworthy that the steady tendency of practice has been to discard the ingenious and complicated contrivances, and to adopt simple, large, and mechanically stable construction. Concerning the combination pan, see some remarks in a previous chapter, on Nevada, under the head of Lincoln County.



THE SETTLER.

The work of the settler, in the system of amalgamation, is to separate the minute particles of mercury and amalgam from the pulp through which they are distributed. It resembles a pan in some respects, being made up of a circular box, in which revolves a central axis carrying arms, and to these arms are fixed shoes. These iron shoes, however, do not come in contact with the bottom of the settler, as no grinding action is desired. They are faced with wooden rubbers, which keep the heavier parts of the pulp thoroughly stirred up, while the revolving arms perform a similar service for the lighter portions floating above. The pulp is thinned by a stream of water during the operation, for which reason the settler has a larger capacity than the pan. It is formed of a conoidal iron casting, in the hollow axis of which works the upright to which the revolving arms are fastened. The sides of the settler are of wood, but sometimes sheet-iron is used instead. Holes stopped by plugs are pierced in the sides at different levels, through which the thinned pulp can be gradually drawn off. On one side is bolted an iron quicksilver bowl, communicating with a radial gutter cast in the iron bottom. The rotary part of the apparatus consists of

the central shaft before mentioned, which carries on its lower end a beveled cog-wheel, and at its upper end an arrangement for adjusting the height of the wood rubbers so as to lower them as they gradually wear away. This arrangement, which is a duplicate of the devices for a similar purpose in the pans heretofore illustrated, consists in a deep collar embracing the vertical part of the conoidal iron bottom of the settler, and hung upon the shaft by a screw furnished with a hand-wheel. The revolving arms are carried out from this collar. All these details are plainly shown in the accompanying cut.

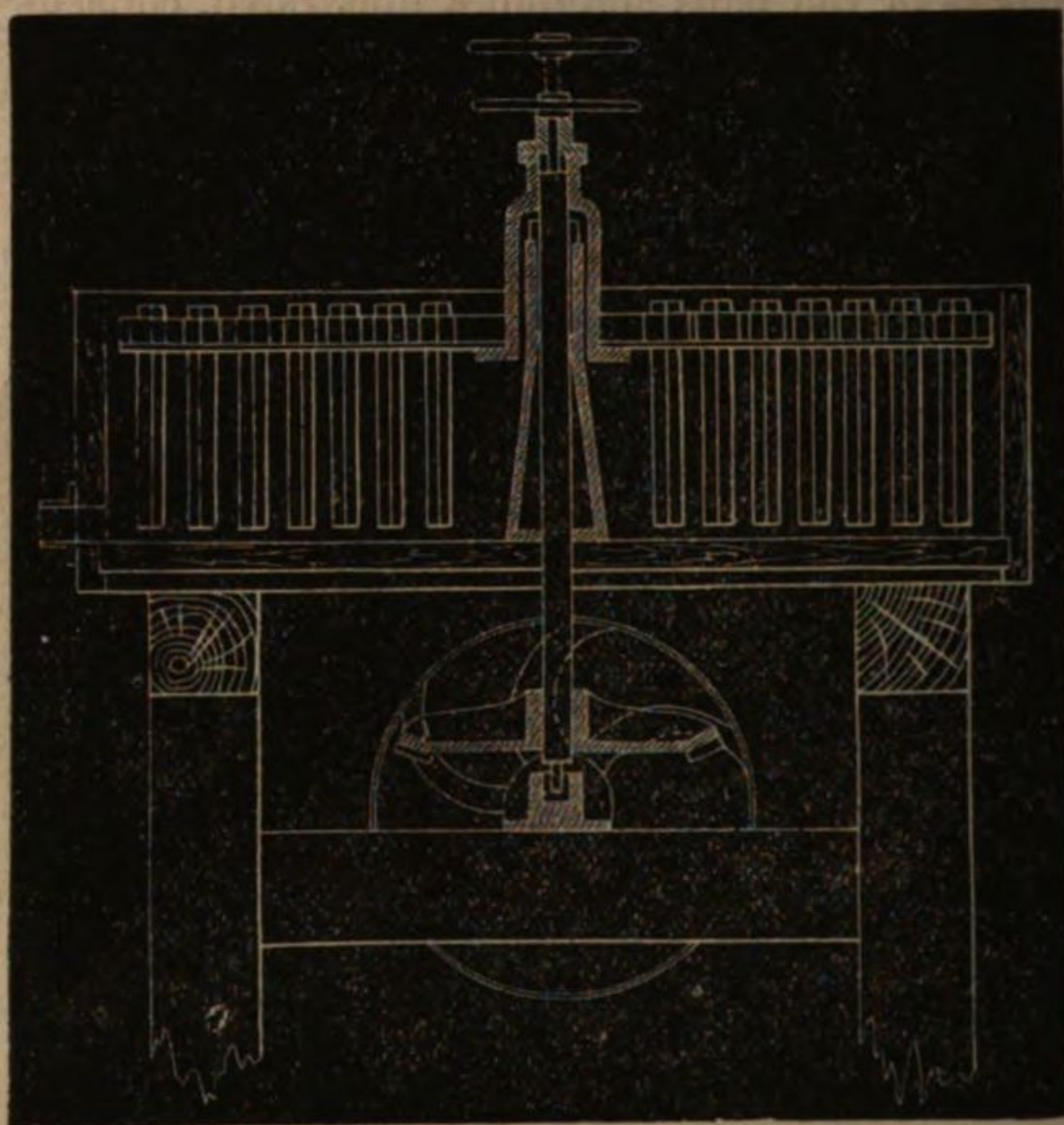


THE AGITATOR.

The battery-slimes, after being amalgamated in the pan and the amalgam collected in the settler, are run to a third receptacle resembling the pan and settler, but of larger dimensions and with different working apparatus. Some kinds of amalgam, such as those containing copper or antimony, are friable, and on account of their fineness cannot be recovered from the pulp while it is thick. It is therefore run into a circular tank or tub in which wooden stirrers revolve, a copious stream of water running constantly in at the top. Here the pulp is thoroughly beaten up and thinned, and while the lighter parts flow off with the current, the amalgam and floured mercury fall to the bottom and collect there. This amalgam is always both poorer and less pure than that from the settler.

The illustration shows one of H. J. Booth & Company's agitators. It is formed of a round tub, the bottom and sides of which are made of wood. In the center a hollow cast-iron cone is bolted, through which rises the shaft, driven by a cog-wheel below. A cast iron cap or carrier

rests on the top of the shaft, and from this project iron arms, in which are fastened the wood stirrers, hanging vertically and reaching down nearly to the bottom of the tub.



ARRANGEMENT OF A SILVER MILL.

The illustration shows the arrangement of a silver mill for dry crushing, provided with a Stetefeldt furnace for chloridizing the ores. The reduction of the ore to the proper size begins in nearly all cases with the Blake crusher. From that it passes to the stamping floor, in this case to a self-feeder, which supplies it to the stamps. When the ore is roasted a drying floor is placed between the rock-breaker and the self-feeder. This floor is made of cast-iron plates 3 by 3½ feet square and flanged on two contiguous sides. The plates overlap, and rest on walls forming a double flue under them. Heat is supplied by what would otherwise be the waste gas from the chloridizing furnace. The dried ore is shoveled to the stamps or to the self-feeder. From the stamps the powdered ore is conveyed by a traveler to a bucket-lift which raises it to a pulp-feeder on the top of the furnace. In the latter it immediately reaches a red heat, the extreme fineness of the particles making the process of heating almost an instantaneous one. It falls through an atmosphere of hot chlorine gas and by the time it has reached the sole of the furnace, 85 to 96 per cent. of the silver has been thoroughly chloridized.

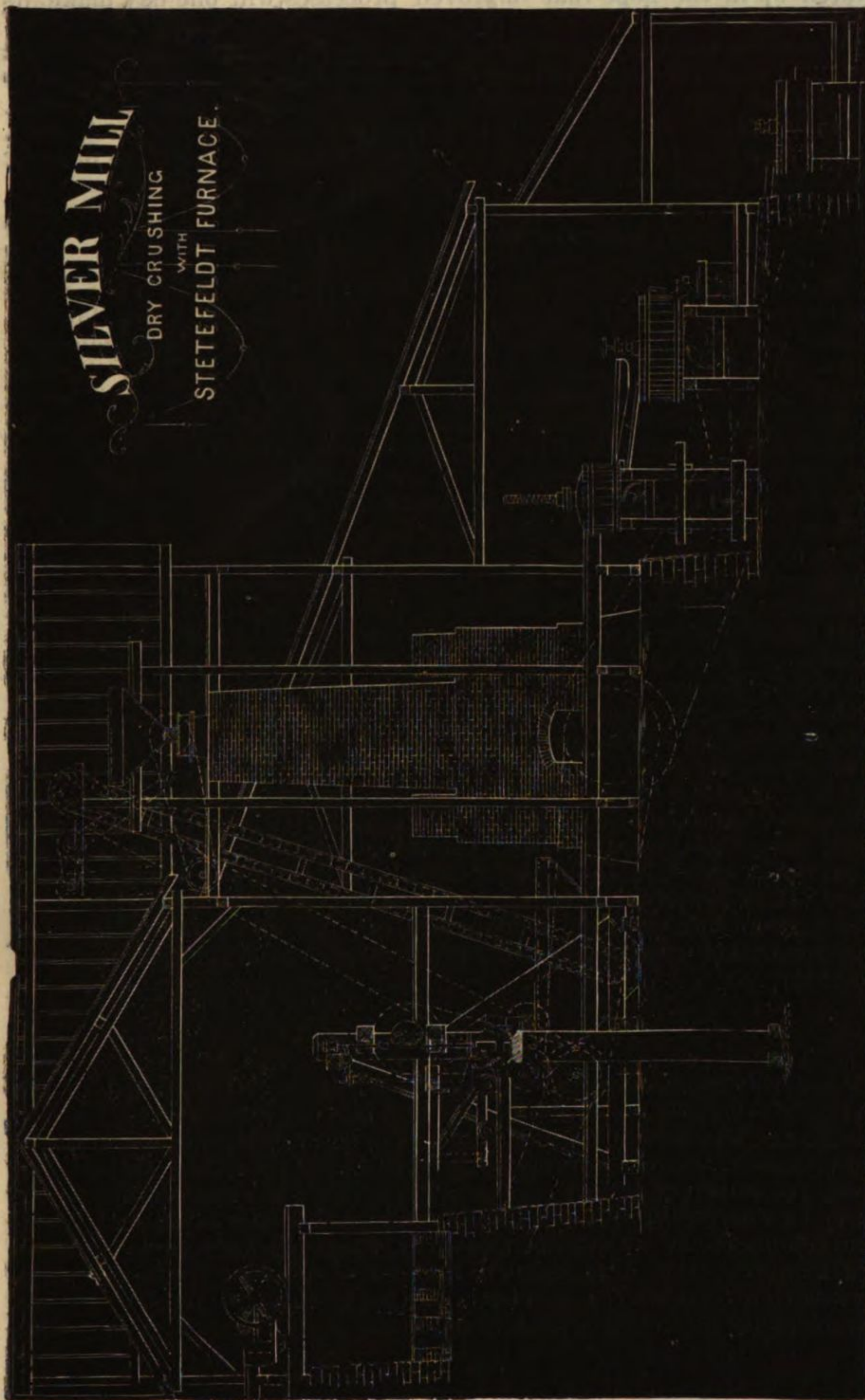
From the furnace the pulp is drawn on the cooling floor, from which it goes to the pans, the principal styles of which we have already described. From the pans to the settlers and thence to the agitators, the pulp passes until it has not only been thoroughly treated but has deposited the last obtainable portions of mercury. Its last work is to collect in the settling vats outside the mill, from which it is taken and

SILVER MILL

DRY CRUSHING

WITH

STETEFELDT FURNACE.



stored up in the hope that improved processes will one day make its remaining wealth available.

When no chloridizing furnace is employed, the pulp is sometimes received from the stamps in cars and taken direct to the pans. Other details are often altered to suit the circumstances of particular cases.

One of the main points in these mills is the disposition of the belting. It has received the closest attention of mill-builders, who have brought the system to a wonderful state of efficiency.

ARRANGEMENT OF A GOLD-MILL.

The engraving shows the ore from the mine thrown down before the Blake rock-breaker. From this machine the broken ore passes down an incline to the self-feeder, and thence to the stamps. Amalgamation often takes place, in the first instance, within the battery-box. Considerable gold is also gathered from the bottom of the box, not having been pounded fine enough to pass through the screens. In front of the latter is an apron of amalgamated plates, which is the second trap set to catch the metal. Beyond the apron come the blanket-tables, where the pulp undergoes mechanical separation, the resulting two qualities receiving different treatment.

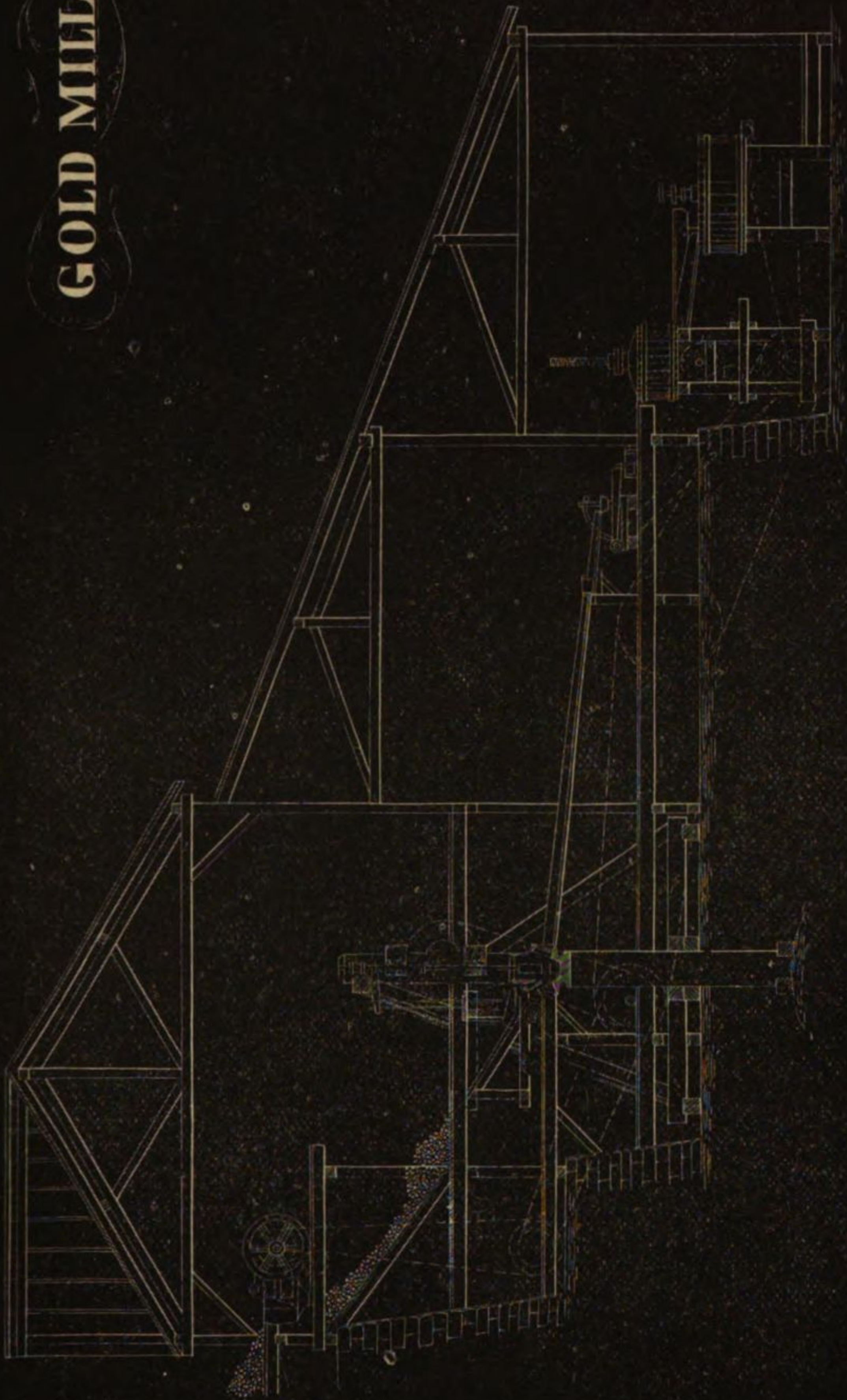
The sands which pass the blankets, and are therefore of second quality, are passed through the first concentrators, then through the second concentrators, and finally into the tail sluices outside the building. The sand which remains on the blankets is washed into tanks, then passed through Atwood vats and over copper riffles, after which it goes through the second concentrators and tail-sluices, like the second quality.

Other arrangements are followed, but they all obey one rule—to obtain as thorough a separation of the gold as is possible by repeated reworking of the sand. In the figure, the long blanket-table is seen reaching from the battery to the first concentrator. Below the latter are a Wheeler amalgamating-pan and a settler, the latter being a step interposed before the tailing-sluices. On the concentrators, pyrites, or, as it is generally called in the West, “sulphurets,” is obtained more or less pure. It is usually roasted in reverberatory furnaces and treated by chlorination, but when the amount will not pay for this treatment the concentrated mineral is sometimes run through a good grinding-pan with mercury.

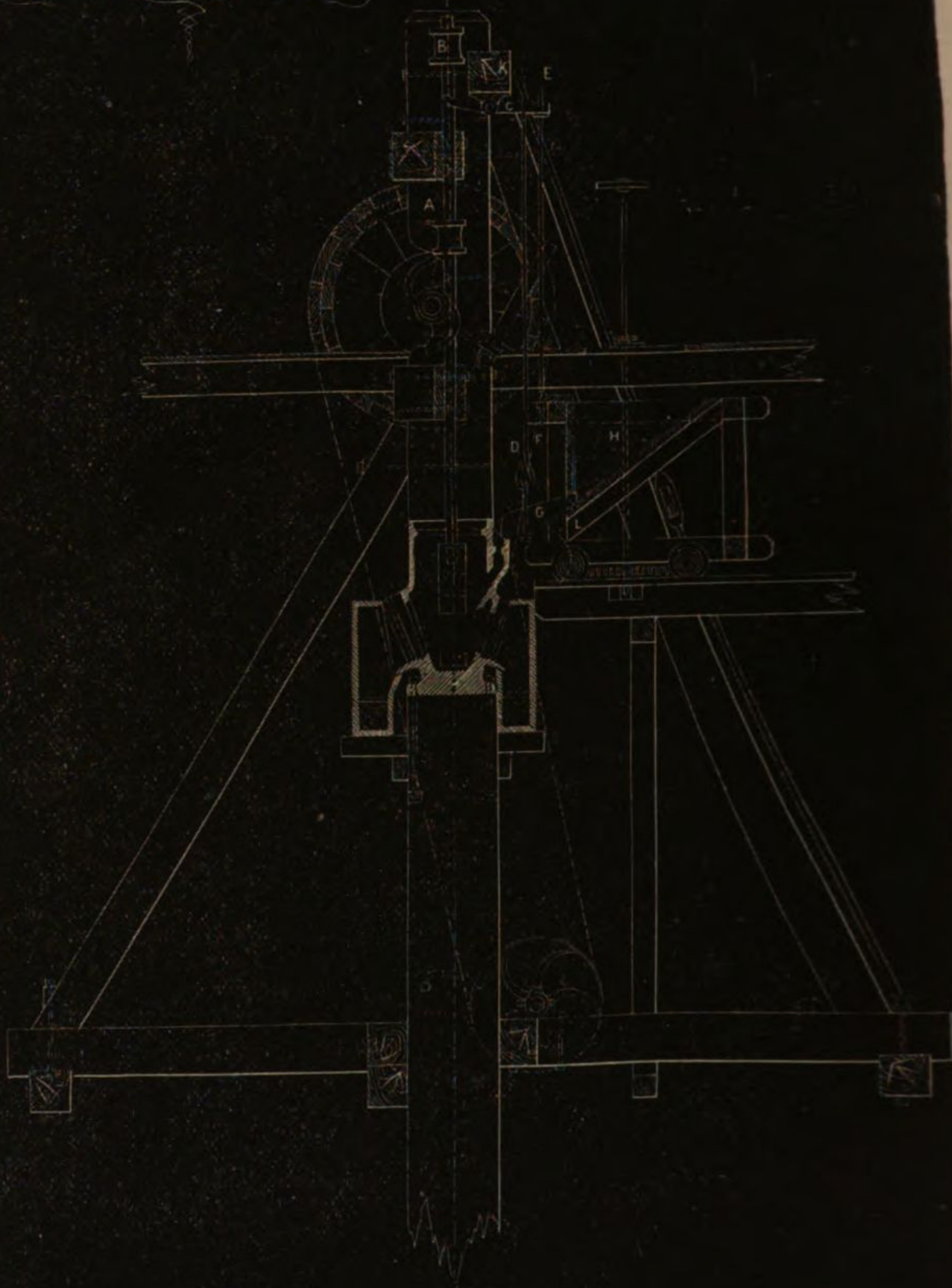
STANFORD'S SELF-FEEDER.

Were the importance of automatic battery feeders confined to the saving of labor, they would probably find no very extensive use, for although the business of milling is one that requires the closest scrutiny and economy, the one workman employed in each working shift for the feeding of fifteen or twenty stamps is not an item of expense sufficiently heavy to warrant in all cases the introduction of the large and somewhat cumbersome apparatus necessary when the machine is to do its own feeding. But it is claimed that these automatic arrangements work with a regularity, a precision, and an attention to duty which are matched only by the most faithful laborers.

GOLD MILL.



STAMP BATTERY
WITH
STANFORD'S SELF FEEDER.

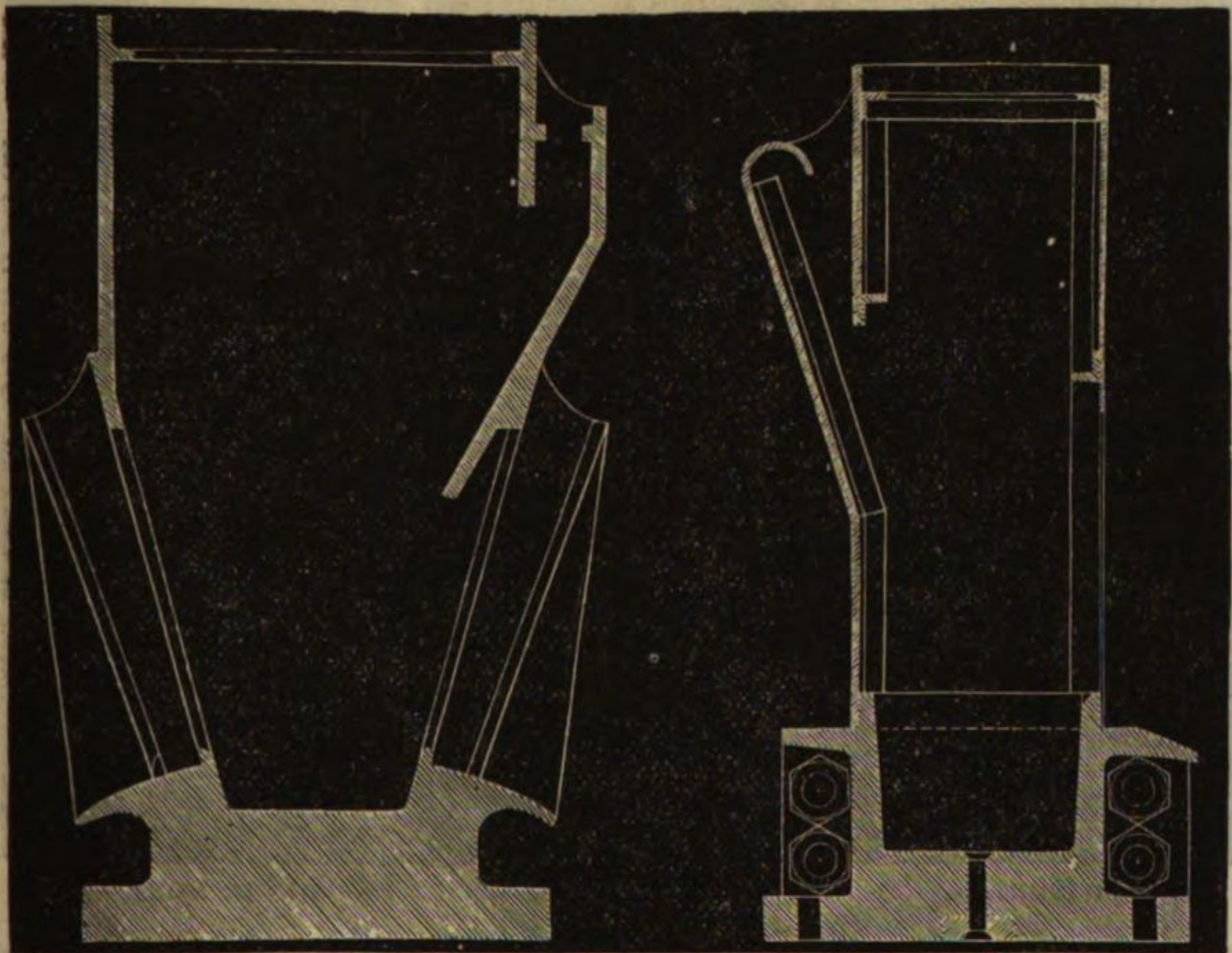


Mr. C. P. Stanford has devised a feeder, which is now manufactured by the Union Iron Works of San Francisco. The removal of ore from under the stamps by powdering and washing through the screen, lets a tappet, B, on the stem, A, down on a lever, C. The motion is communicated to the feeding screen and a small quantity of ore is thrown into the battery, the action continuing until the ore on the die has accumulated to such a height that the tappet no longer falls far enough to touch the lever. This tappet is usually placed on only one stamp in a battery—generally the middle one. The tappet being adjustable, allows the rapid alteration of the quantity of ore thrown down by the feeder in a given time.

The illustration shows the application of this feeder to a battery for silver-ore, crushing dry. The powdered ore passing through the screens falls into side boxes, in which works a worm, or some similar device which conveys it to the proper receptacle.

MORTARS.

One of the most distinctive features of American stamp-mills, and also one of the most creditable improvements which have grown out of the application of American inventive genius to the machinery for treating ores, is the mortar or stamp-box used in California mills. Its particular advantages are durability and *completeness*, by which I mean

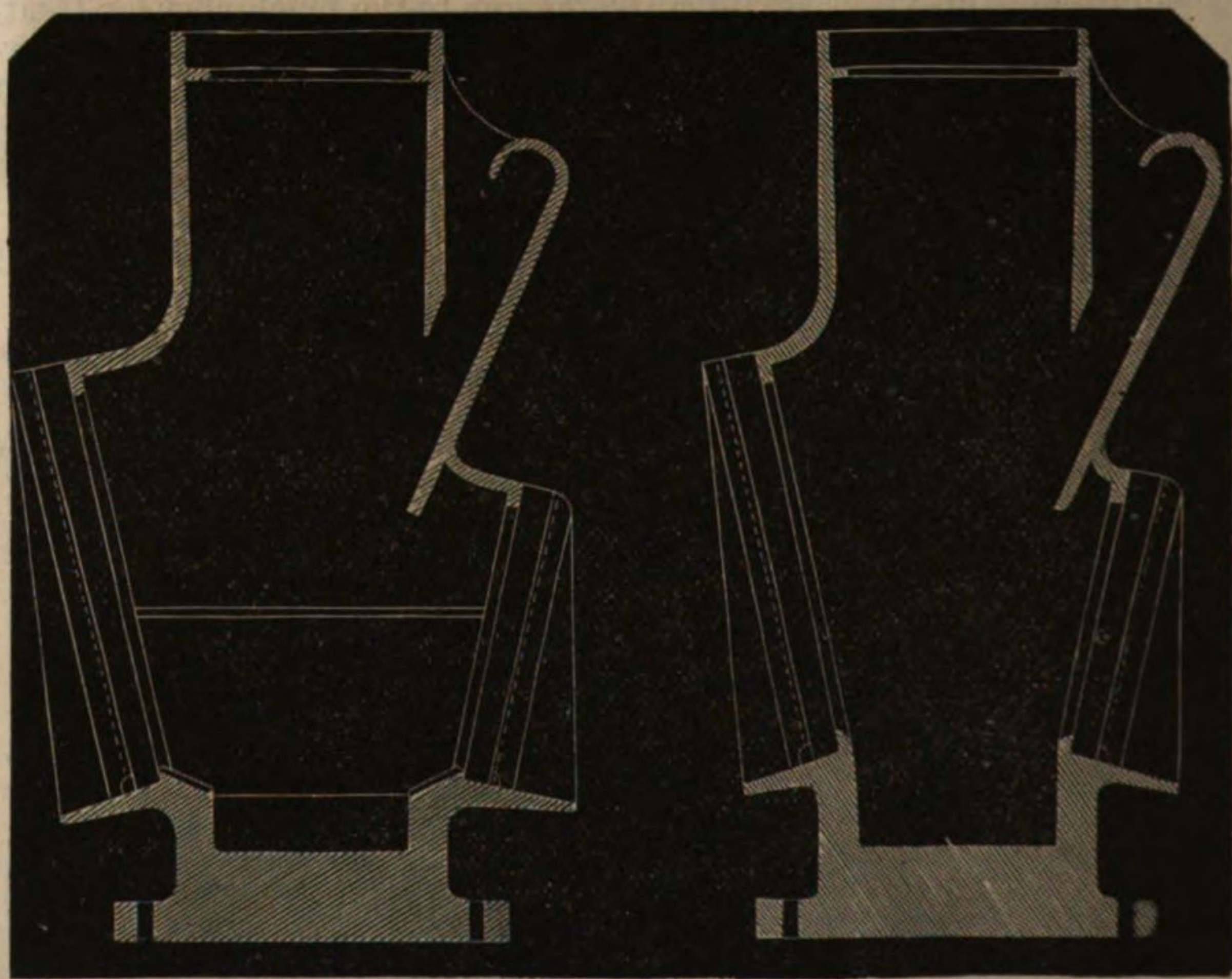


DRY MORTAR.

SECTIONAL MORTAR.

not only that it fulfills all the functions desirable in a battery-box, but also that all parts which are not necessarily movable are combined in one casting, and the box is therefore ready for rapid setting up. Of the mortars for dry-crushing there are two sorts, one solid and one sectional, the latter being made in parts for convenience of transportation over mountain-roads. Both of these are herewith illustrated. In the dry mortar the die is set high, the screens are steeply inclined, and there is a double discharge. The peculiar requirements of American

silver-milling make this dry mortar quite different from that in ordinary use in Europe for dry-crushing. Thus the discharge is at the side instead of in the bottom, as in those mortars which are used for very coarse crushing, a difference which is necessitated by the extreme fineness demanded in milling silver-ores. The mortar has a width of bottom of about 11 inches, suitable for a die of eight inches, and an outside length of 52 inches. Its material is cast-iron. The sectional mortar has a cast-iron bed, made in sections, and fitted with a wrought-iron top. These sections are held together endwise by strong bolts, and sidewise by a long bar fitted into a groove planed in the bottom and riveted to the sections. When set up it makes a perfectly firm mortar. Somewhat different is the form adopted in mortars for stamping gold and silver ores wet. In gold-milling the interior of the mortar forms the most effective amalgamating surface, and the stamp-box is therefore arranged in such a way that it can be lined with copper plates. A seat is formed on the inside of the die-step, at the foot of the screens, the purpose of which is to afford means for placing a copper plate at the point where more gold settles than in any other given spot in the entire system of battery and amalgamating plates. This small plate



GOLD MORTAR.

SILVER MORTAR.

takes up the gold while it is still coarse, and places it beyond the possibility of loss by further powdering. A convenient arrangement for the ready placing of these interior copper plates is an essential requirement of mortars for gold-mills, for this is one of the most frequently recurring tasks connected with the treatment of auriferous ores. It is also a task that necessitates the stopping of the stamps and the loss of a certain amount of time.

The mortar for silver-ores is narrower than the above, and also has a deeper die-seat. As its use is confined to reducing the size of the ore and no other work goes on within it, the arrangements for the insertion

of amalgamating surfaces are omitted. Here the main requirement is the speedy discharge of the slime after it has been formed. The screens are therefore set near the line of the stamps. All these mortars have a charging slit, one side of which is curved at the top, or narrowed by some similar device, in order to restrict the size of the ore charged, while the expansion of the opening below the top gives a ready fall to any ore that passes the mouth.

CHLORINATING WORKS.

Chlorination, though suited to every kind of gold-ore, is mainly confined in the West to the "sulphurets" which are obtained in treating the ordinary gold-ore. This ore contains a variable amount of iron pyrites, the average being, perhaps, 2 or 3 per cent. These sulphurets are in small works merely passed through a pan and subjected to long grinding, when a considerable proportion of the gold present will be taken up by the mercury. When, however, the richness of the concentrated pyrites, or the magnitude of the works will warrant the expense, chlorination is resorted to, and very excellent examples of these works are to be seen at Grass Valley, California.

The process of chlorination has been described in former reports, and in a preceding chapter of the present report. So much only will be here repeated as may serve to explain the accompanying illustrations.

The process in general consists in passing dry chlorine through finely-powdered ore, which, however, must be free from sulphur, since this substance would cause a precipitation of the gold. The production of soluble perchloride of iron must also be avoided, for the reason that this precipitates gold from its solution. The theory of the process is the formation of a soluble salt of gold—the chloride—which is then removed by lixiviation, and the gold is obtained by adding a precipitating agent to the liquor. If any precipitation takes place within the dissolving cask, it is evident that so much of the gold will be lost. The precipitating agents most to be avoided are sulphur, antimony, arsenic, and iron, though the peroxide of this metal is not injurious. The first step is, therefore, complete roasting. This is done in reverberatory furnaces. Bruckner's cylinders, or Stetefeldt furnaces, might, perhaps, accomplish it, but have not, so far as I know, been so employed. The powdered and roasted ore is placed in the leaching vats, Fig. 1. These are merely

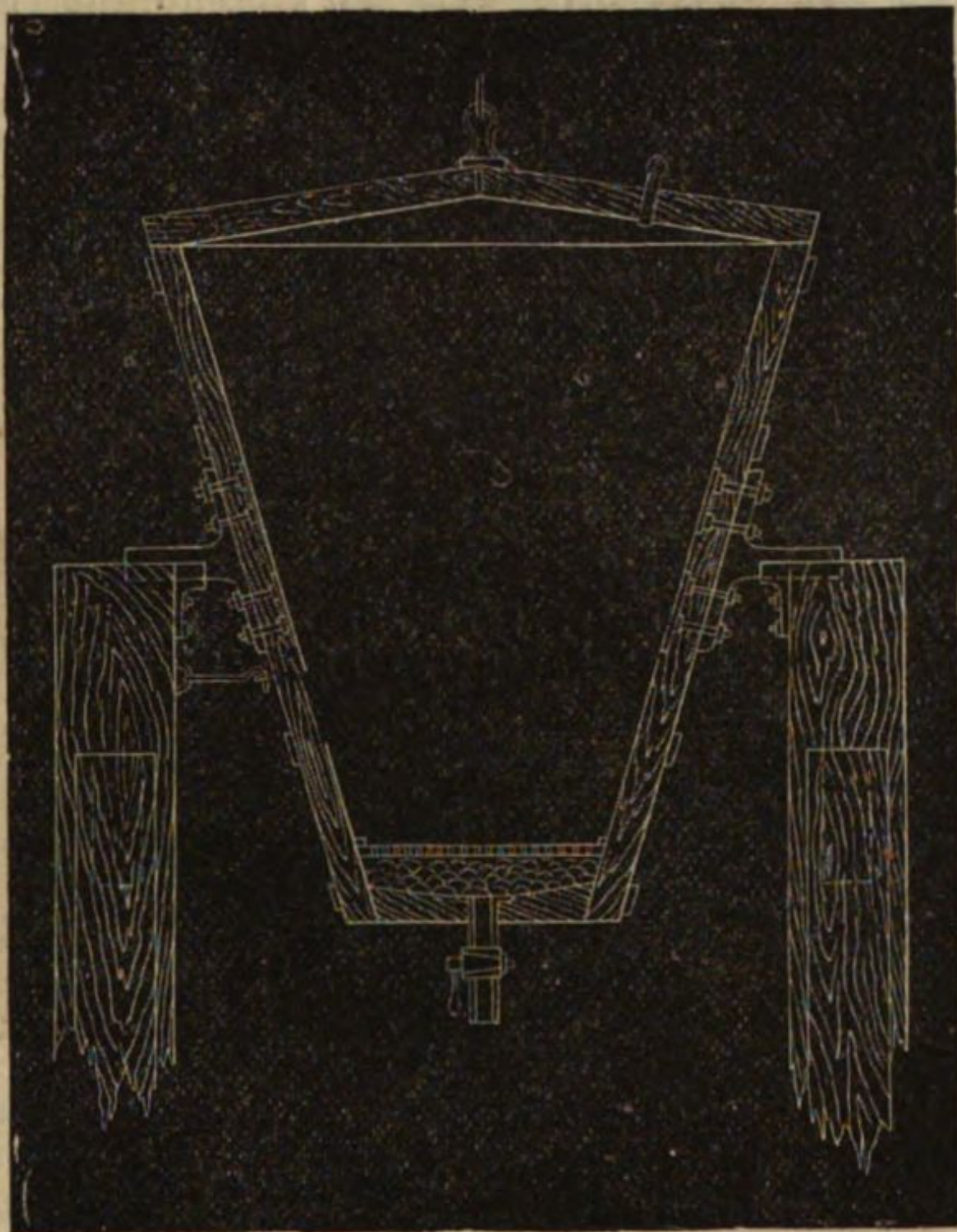


Fig. 1.

wooden tubs swung on gudgeons, and with a filter on the bottom, made of pieces of quartz laid under a perforated earthenware cover. These vats are closed air-tight by rubber joints under the covers. Pipes in the covers connect the vats together, so that the gas which is introduced at the bottom passes through the whole row of vats. The ore is slightly dampened, but must not be wet.

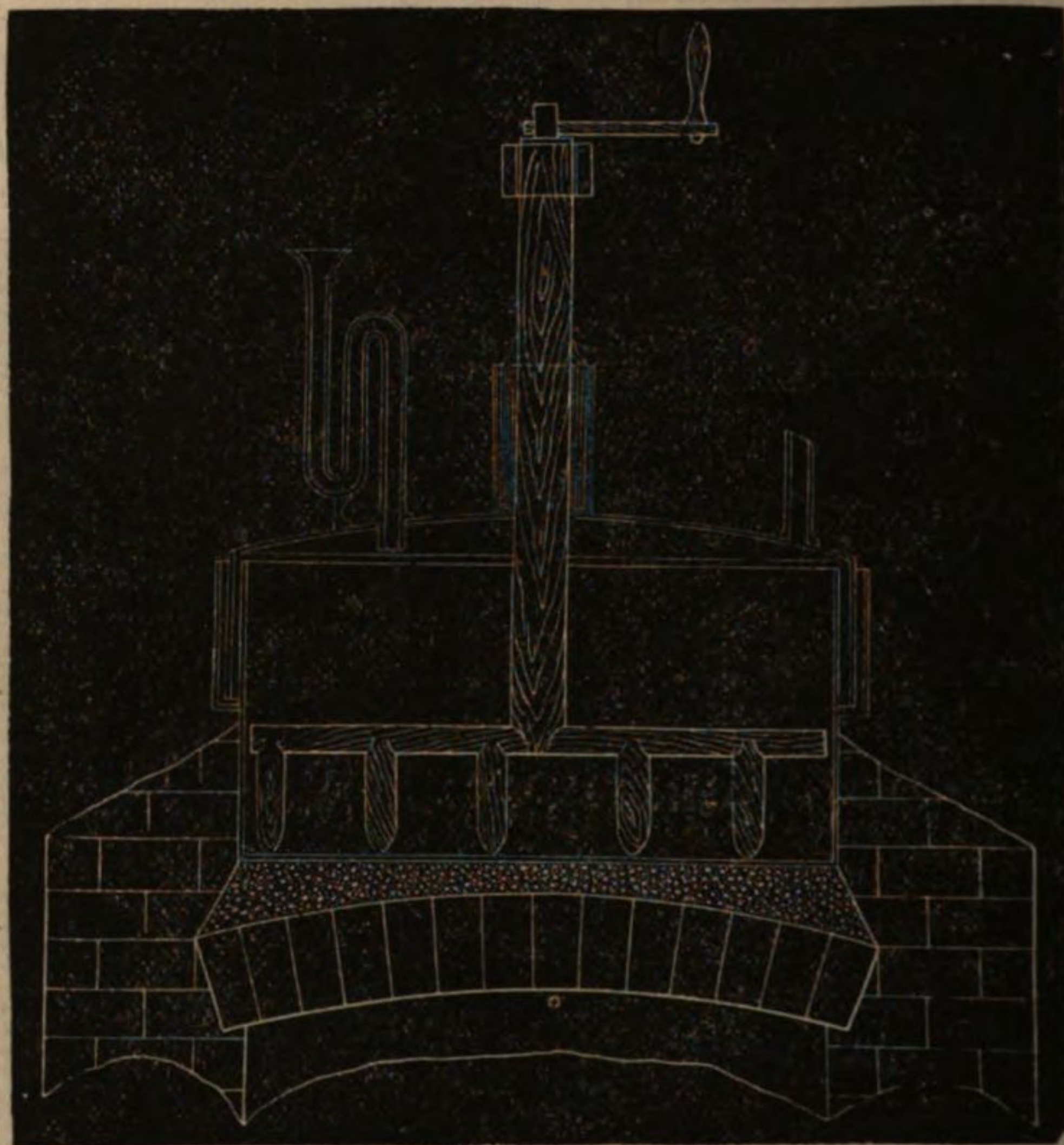


Fig. 2.

Fig. 2 shows the gas-generator. It consists merely of a lead chamber, containing an agitator of hard wood, and closed by a cover resting in a water-joint. The whole rests on a sand-bath. Between the generator and the leaching vats is placed a wash-bowl, where any hydrochloric acid in the gas is removed. When the operation is ended, the soluble chloride of gold is extracted by warm water, and the spent ore is tipped into dump-cars. The solution is run to precipitating tubs, where the gold is thrown down by solution of sulphate of iron, oxalic acid, &c.

With proper care the process is a very perfect one, yielding 97 per cent. of the gold, which is very fine. It ought not to cost in California, according to Messrs. Booth & Co., of San Francisco, more than \$12 a ton.

In Fig. 3 is shown an arrangement of chlorination works designed by Messrs. Riotte & Luckhardt, of San Francisco. It includes the use of the Bruckner cylinder, which is seen at I, the starting-point of the operation. The leaching vats are placed at A, in a row, with the gas-generator D in the center. C is a rail-car for removing the spent ore from the building, while the precipitating tubs are seen at B. At E is seen the waste tub, where the water runs through sawdust before being finally discharged.

CHLORINATION WORKS

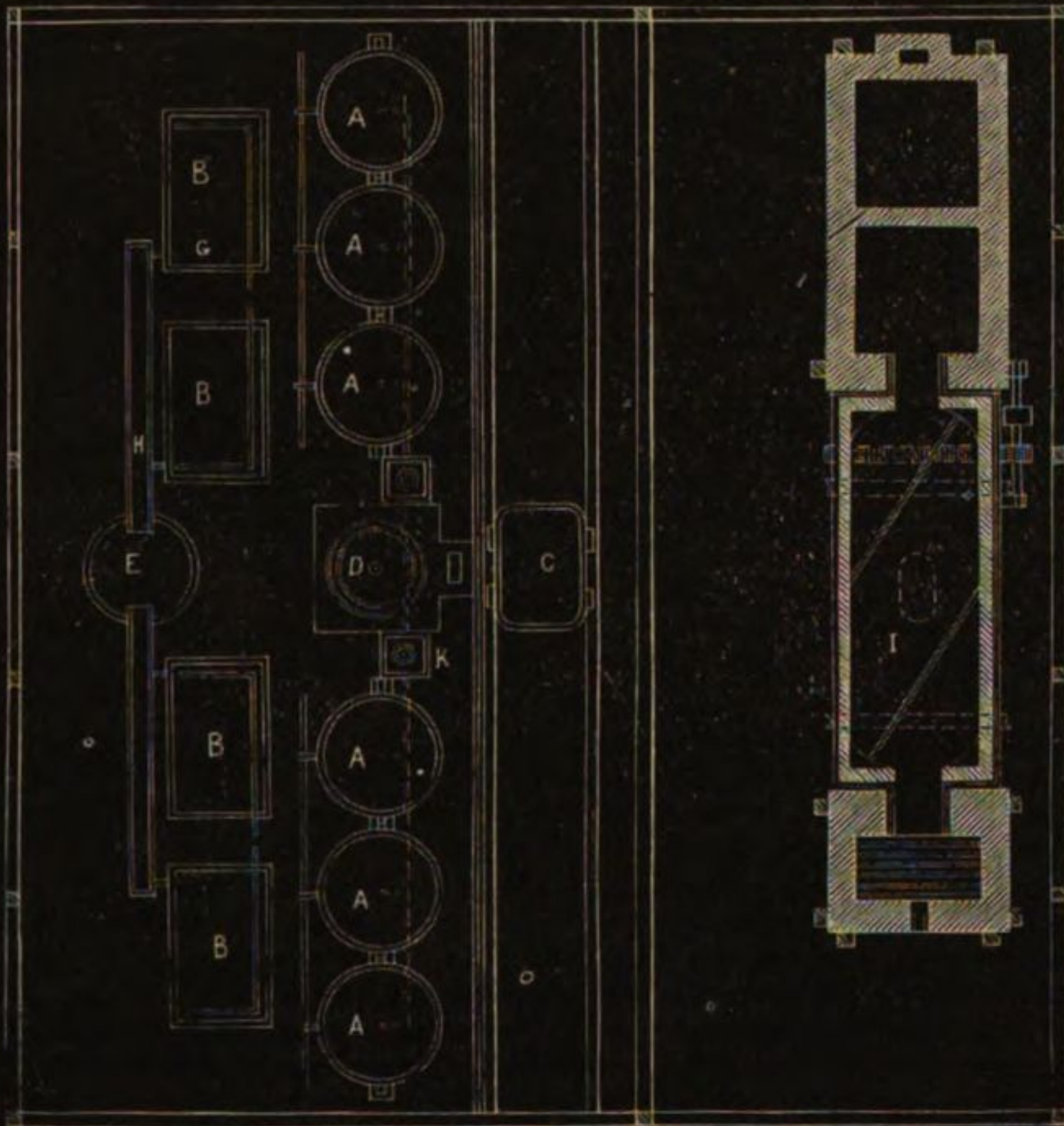
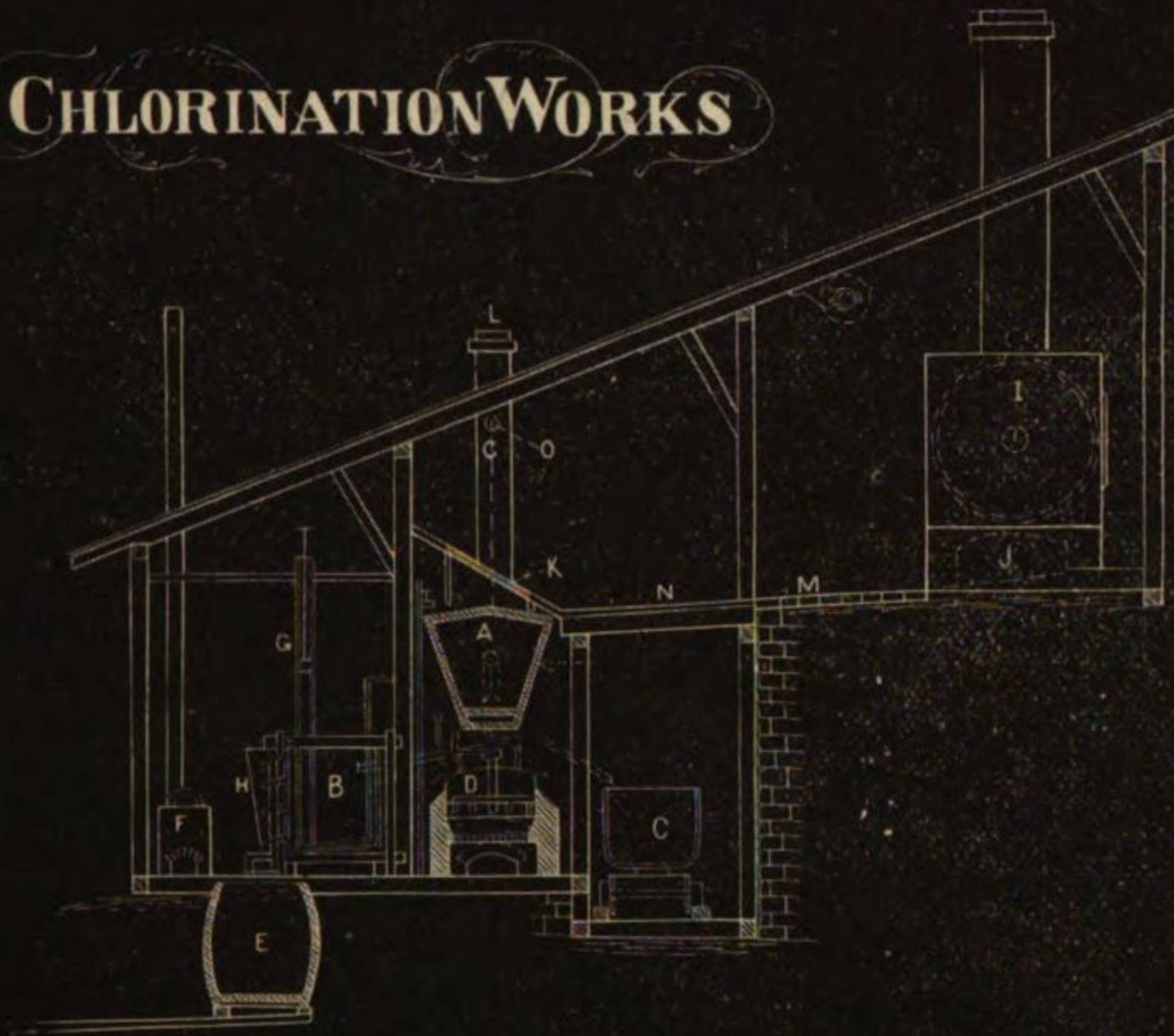


Fig. 3.

CHAPTER XX.

GENERAL GEOLOGICAL MAP OF THE UNITED STATES.

The colored lithograph-map, a copy of which accompanies this report, was prepared by Professor C. H. Hitchcock, with the assistance of Professor W. P. Blake, primarily for the Superintendent of the Census. I was able to render some advice and assistance in the execution of the plan, with the understanding that, if the requisite authority could be obtained from Congress, an edition of the map might be prepared for the report on mining statistics. I could not have undertaken, within the limits of my official instructions and of the usual appropriation made for my work, to carry out in such detail as would certainly be desirable the expensive and laborious undertaking of a complete geological map or atlas of the United States. The aim was, therefore, to obtain, at an expense so small as to permit its circulation as a public document, a map exhibiting the general geological features of the country, more comprehensively and accurately than any already before the public. The result has, I think, vindicated the wisdom of this attempt, and reflects credit upon the scientific gentlemen who generously gave themselves to the work. Certain severe criticisms of the map, in which it has been compared with very costly and elaborate charts issued in other countries, lose their force in the light of the foregoing explanation.

The map has been redrawn, with a few slight alterations, for the present edition. The following description of it is taken from the volume on Industry and Wealth of the Ninth Census, with a few additions and changes made on the authority of recent communications from Professor Hitchcock :

For the elaborate geological map of the States and Territories, which accompanies the present volume, the Census-Office is indebted to Professor C. H. Hitchcock, of Dartmouth College, Hanover, N. H., who has for many years been engaged in the collection of information, both printed and in manuscripts, from the best geologists, for the purpose of constructing a complete geological atlas of North America. The present effort is the first fruit of these labors. The information was designed primarily for the larger work, but, in consequence of unavoidable delays in the issue of the atlas, Professor Hitchcock has felt himself justified in compiling from it for the publications of the Ninth Census this preliminary map, which the Superintendent submits to the country, with a confidence derived from long knowledge of the scholarly care and conscientiousness which characterizes all of the author's works. The following notes from Professor Hitchcock contain all the explanatory or descriptive matter which it is deemed essential to present in this place.

In the work of compilation great assistance has been rendered by Professor William P. Blake, of Connecticut, who is responsible especially for the coloring of the western portion of the map. Professor Blake's knowledge of the Territories, both on account of personal observations and editorship of the results of other explorers' work in the reports of the Pacific Railroad surveys, enables us to present the best interpretation of the geological structure of the Territories yet offered to the public.

The following are the authorities used in the compilation of the map ; only the maps employed in the compilation are cited. The special sources for the several primary maps will be given in the larger work to which reference has been made.

Maine.—Manuscript map prepared by C. H. Hitchcock for the State authorities in 1863.

New Hampshire.—Manuscript map prepared by C. H. Hitchcock, in 1872, as the result of the geological survey now in progress.

Vermont.—C. H. Hitchcock's map as published in the final report, corrected by the latest discoveries.

Massachusetts.—E. Hitchcock's map of 1844—an improvement over the one in final report, and not generally known to exist. This has been improved by his own later observations and those of C. H. Hitchcock.

Rhode Island.—C. T. Jackson's map in final report improved by C. H. Hitchcock.

Connecticut.—Essentially the map of J. G. Percival.

New York.—Official survey-map of 1843, improved by James Hall, in Logan's map of Canada, 1869, and by others.

New Jersey.—Latest map, by Professor George H. Cook.

Pennsylvania.—Map of geological survey, 1858.

Maryland.—Map of geological survey, improved by P. T. Tyson.

Delaware.—Geological report, (no map,) by J. C. Booth.

Virginia and West Virginia.—Map prepared by W. B. Rogers in 1844, from the observations of geological survey, never published. Professor Rogers's ill-health has prevented him from examining our copy, and any errors that may possibly exist must be ascribed to this circumstance.

North Carolina.—Manuscript map, by W. C. Kerr.

South Carolina.—Tuomey's and Lieber's maps, revised by F. S. Holmes.

Georgia.—Map in White's Statistics, with improvements, especially in northwest part of the State, by J. M. Safford.

Florida.—No map of this State has ever been made.

Bahama Islands.—Manuscript map of W. M. Gabb.

Alabama.—Manuscript map, by Dr. G. Little. Northern part, by J. M. Safford.

Mississippi and Louisiana.—Manuscript map, by E. W. Hilgard.

Tennessee.—Map of final report, improved by James M. Safford.

Kentucky.—Manuscript map, by S. S. Lyon, prepared from the results of geological survey, under the direction of D. D. Owen.

Ohio.—Latest map of J. S. Newberry.

Michigan.—Lower peninsula, from map of Alexander Winchell; upper peninsula, from map of Foster and Whitney, with improvements by Logan.

Minnesota.—Mostly from Logan's map, with suggestions from C. A. White, and a paper by James Hall.

Wisconsin.—Manuscript map by J. A. Lapham, expressly prepared for the purpose mentioned above; largely from J. D. Whitney's report.

Iowa.—C. A. White's latest map.

Illinois.—A. H. Worthen's manuscript, embodying results of his survey.

Indiana.—Manuscript map, by Richard Owen, former State geologist.

Missouri.—Manuscript map, by G. C. Swallow, former State geologist.

Kansas.—Compiled from information given by G. C. Swallow, Meek and Hayden, J. L. Leconte, J. S. Newberry, and W. P. Blake.

Arkansas.—Chiefly from manuscript map of Richard Owen, compiled from report of D. D. Owen.

Indian Territory.—Marcy's Red River Expedition, Jules Marcon's report, and other sources; revised by J. S. Newberry.

Texas.—S. B. Buckley's manuscript map for the eastern portion; maps of various Government expeditions, carefully considered, by W. P. Blake and J. S. Newberry.

New Mexico and Arizona.—Manuscript map, by J. S. Newberry.

Colorado.—Parts by J. S. Newberry, F. V. Hayden, and W. P. Blake.

Utah, Nevada, California, and Oregon.—Compiled by W. P. Blake, from personal observations; Pacific Railroad reports, both for United States and railroad corporations; California reports, by J. D. Whitney; geology of 40th parallel, by Clarence King, and other sources.

Dakota, Montana, Idaho, Wyoming, and Nebraska.—Maps by F. V. Hayden, (Raynolds expedition, and final report on Nebraska.)

Washington Territory.—Compiled by W. P. Blake, from manuscript notes of George Gibbs and other sources.

Canada.—Sir W. E. Logan's map, published in 1869.

The formations are arranged in nine groups, not in every respect the most natural, but the most convenient, from the material in existence. The first group of *Eozoic* includes the granites and other metamorphic rocks; both those older than Paleozoic and those more recent. In the Appalachian region there may be some Paleozoic crystalline schists. In the Territories and along the Pacific border there are many crystalline schists of Mesozoic age, a few patches of which are indicated; but their entire limits are unknown as yet. In this group is included the *Huronian system*. These are the talcose rocks of the eastern border region, referred to the Lower Silurian by W. E. Logan and others. They are largely developed in Maine.

The *Silurian system* is made to extend from the Paradoxides beds to the Lower Helderberg inclusive, in accordance with the general usage of American geologists. There is good reason to believe that the limits of the Silurian should be modified in accordance with the views of Professor Adam Sedgwick, of Cambridge, England. In the Silurian are included the "Calcareous mica-schist" of Vermont, the "Coös group" of New Hampshire, the "Merrimack group" of New Hampshire and Massachusetts,

and some schists in North and South Carolina, whose precise position is not well determined.

The Paleozoic rocks in the western portion of the map are undivided, as is true, also, of the Cenozoic, save a few post-tertiary lacustral areas and deltas. The lacustral areas will be much enlarged in the future, as our information shall be more precise.

COAL-MEASURES.

The most important division for giving accurate practical information is that of the "Coal Measures." With it is included in Nebraska, Kansas, and Indian Territory an inconsiderable area of Permian and Permo-carboniferous.

The following are the areas of the coal-measures in the United States:

New England basin, in Massachusetts and Rhode Island, estimated to cover 750 square miles. The coal is a plumbaginous anthracite, used to advantage in some smelting furnaces. Perhaps eleven beds may exist; best seen in Portsmouth, Rhode Island. The maximum thickness is 23 feet. The whole carboniferous system is supposed to be 6,500 feet thick, of which 2,500 pertain exclusively to the coal-measures.

Anthracite basins in Pennsylvania.—This is the most important coal district in the United States. There are four basins, having an area of 410 square miles, not including the Broad-Top semi-anthracite, which amounts to 24 more. The measures are from 2,000 to 3,000 feet thick. The number of distinct beds varies from two to twenty-five, according to the depth of the basin. The maximum amount near Pottsville is given at 207 feet, while the average cannot be far from 70 feet.—(H. D. Rogers.) Macfarlane estimates the area of the anthracite fields in Pennsylvania at 472 square miles, which is 62 square miles more than Rogers's estimate.

The *Appalachian field* embraces an area of 62,025 square miles, extending from Pennsylvania to Alabama.

In Pennsylvania the aggregate thickness of the measures is from 825 to 2,535 feet. The area of the bituminous coal is 12,222 square miles, with an average thickness of 40 feet of coal.—(H. D. Rogers.)

In Maryland the area is 550 square miles, in three separate basins. The strata are 1,500 feet thick. There are thirty-two beds in all—one of 14 feet, three of 6 feet each, others from 1 to 5 feet thick.—(P. T. Tyson.)

In Virginia (chiefly West Virginia) the coal area embraces 16,000 square miles. On the Kanawha the strata are 1,250 feet thick, with twenty-four beds of coal, of which eleven have an aggregate of 51 feet thickness. The coals seem best developed on this river.—(T. S. Ridgway.)

In Ohio, Dr. J. S. Newberry states the area to be more than 10,000 square miles, with a thickness of 1,500 feet, and 10 workable beds of coal, corresponding in number and thickness to those of Pennsylvania and West Virginia.

In Eastern Kentucky the area has been stated to be 10,000 square miles. Macfarlane puts it at 8,983 square miles, said to have been derived from actual measurement.

In Tennessee, Prof. J. M. Safford states the area of the measures to be 5,100 square miles. One characteristic section gives a thickness of 14 feet. The beds vary locally in their dimensions, some of them being 9 feet thick, but thinning out very rapidly.

In Georgia the area may be represented by 170 square miles.

In Alabama the area marked upon the map amounts to about 9,000 square miles.

The *Michigan basin* has an area of 6,700 square miles, with 123 feet of measures and 11 feet (maximum) of coal. In the center the coal is thickest, thinning out to nearly the thickness of paper around the edges.—(A. Winchell.)

The *Illinois basin*, including Indiana and Western Kentucky, covers an area of 47,188 square miles.

In Illinois the measures occupy 36,800 square miles, are 600 feet thick, and contain ten beds of coal, with an aggregate thickness of 35 feet.—(A. H. Worthen.)

In Indiana the measures occupy an area of 6,500 square miles, are 650 feet thick, and contain thirteen beds of coal, with an aggregate thickness of 31 feet.—(E. T. Cox.)

In Western Kentucky the measures are 612 feet thick, including the millstone grit, and carry eleven beds of coal.—(E. T. Cox.) Their area in Western Kentucky is 3,888 square miles.—(S. S. Lyon.)

The *Missouri basin* extends from Iowa to Texas.

In Iowa, Professor White's map shows an area of 18,000 square miles, which is divided into three parts, each about 200 feet thick. The two lower divisions contain the workable coal, which amounts to 8 feet in the second, but to only 20 inches in the upper. As the highest division is everywhere underlaid by the others, the whole area must be regarded as workable.

In Missouri, Prof. G. C. Swallow estimates the coal area at 27,000 square miles, and in Kansas at 17,000 square miles. The measures are 2,000 feet thick, with twenty coal-beds, from a few inches to 6 feet thick.

In Arkansas there seem to be only two beds of coal, which lie below the coal-meas-

ures proper, beneath the conglomerate.—(Lesquereux.) D. D. Owen speaks of some beds from 4 to 5 feet thick, and estimates the area occupied by productive beds at 12,000 square miles.

In the Indian Territory little is known of coal. The officers of the Missouri, Kansas and Texas Railway Company find good banks of coal at several places along their line, several feet thick. The area upon the map amounts to as much as 13,600 square miles. Since the completion of the map it has been ascertained that the coal-measures are covered by the cretaceous formation for a width of about thirty miles along the valley of the Red River in Texas and the Indian Territory; and also that the tertiary area, extending southerly from Preston, is probably of carboniferous age. These discoveries will enlarge rather than diminish the size of the Missouri basin, since the two fields are probably connected beneath the cretaceous beds.

In Texas, according to A. R. Roessler, in the "Almanac," the coal-measures occupy 6,000 square miles. A bed of coal has been reported near Fort Belknap as 4 feet thick. Estimating from Hayden's map the coal-area in Nebraska at 3,600 square miles, the total area of this great basin must be 97,200 square miles.

In Arizona, near Camp Apache, Mr. G. K. Gilbert, of the expedition under the immediate direction of Lieut. George M. Wheeler, reports a bed of coal belonging to the true carboniferous series. It is probable that future explorations may develop other coal-bearing areas in the Territories.

In this sketch no notice is taken of any coals which do not belong to the carboniferous system. Other coals of commercial importance exist, especially in Eastern Virginia, and near the Union Pacific Railway. They usually belong to the triassic or cretaceous formations, and there are lignites in the tertiary.

As I did not receive the necessary authority to publish this map, until after the present report had been transmitted to Congress, I have not had opportunity to prepare an extended discussion of the facts regarding the mineral resources of the country, and their relations to its geological structure. This subject is one of the deepest scientific and practical interest, and cannot be satisfactorily treated in a hastily-written chapter. I shall, at this time, merely make one or two general remarks as to great natural features of the country, which the map is adapted to illustrate.

The enormous extent of coal-deposits of the United States may be seen in the areas of the carboniferous formation on the map. The Rhode Island, Appalachian, Michigan, Illinois, Iowa, Kansas, Arkansas, and Texas fields are fully shown. In addition to these, we have the small triassic fields near Richmond and the vast area of coal-bearing cretaceous and tertiary strata, accompanying the Rocky Mountains from the British frontier to the borders of Mexico. In the cretaceous of the western coast in California and Oregon, we have still another source of mineral fuel, our supply of which is thus seen to be widely distributed, as well as abundant.

This map shows, also, with considerable clearness, the general geological structure of the country. There is no topography indicated in the engraving, but it is not difficult, by simple inspection of the colors, to infer the nature of the surface. The extent and trend of the leading upheavals determining the form of the continent; the Appalachian ranges on the east; the Rocky Mountains, with the Mississippi basin and the gold plains between; the vast corrugated table-land of the inland basin; the volcanic and granitic axis of the Sierra, with the enormous basaltic overflow of the northwest; the agricultural plain of California; the comparatively recent elevation of the Coast Range, are all made visible by the distribution of these colors representing different ages of rocks. The intimate relation between the geological structure and the topographical features of the country may thus be traced on a large scale, and to the initiated eye even the geological history of the country is graphically recorded.

As I have shown in a former report, the distribution of the mineral deposits and mining districts of the United States is also connected

with the great features of continental structure. Thus, as was long ago pointed out by Blake, and has been more elaborately shown by Clarence King, the mineral deposits of the Pacific slope are characterized by an arrangement in parallel zones, running generally north and south. The quicksilver, chromic iron, copper ores, and coal of the cretaceous Coast Range; the gold and the auriferous slates of the west flank of the Sierra; the silver-ores of the subordinate ranges between the Sierra and the Wasatch; the galenas and carbonates of Utah and Montana; the gold of Montana, Wyoming, and Colorado, all follow more or less closely the law of distribution. East of the Rocky Mountains we have, on the other hand, a distribution in basins, rather than in zones, which has been happily described with regard to the relative positions of our coal and iron-ores in the well-known report of Mr. Abram S. Hewitt, a commissioner for the United States at the Paris Exposition. This distribution continues throughout the continental depression of the Mississippi basin, and eastward to the Appalachian formations, where the phenomenon of a zonal structure is repeated, east of the Paleozoic region. We have, extending from the Gulf of Saint Lawrence, through Vermont to Georgia, parallel series of rocks, carrying everywhere similar minerals and ore-deposits. In other words, the same great laws of folding have obtained here as on the Pacific slope, while between the two there exists a great basin, or group of basins, where the deposits lack the zonal character. The nature and causes of this distribution of our mineral deposits east and west can easily be inferred from inspection of this map, and this alone is a sufficient reason for its publication, both in reports of the census and those of mining statistics—documents, an important purpose of which is to display to our citizens and to the world the nature and extent of our resources.

CHAPTER XXI.

MISCELLANEOUS STATISTICS.

For the following statistics of the exportation of domestic gold and silver during 1872, I am indebted to the Bureau of Statistics, Treasury Department:

Amount of domestic gold and silver exported during the twelve months ended December 31, 1872.

Coin	\$56, 430, 530
Bullion	35, 864, 706
Total	92, 295, 236

Statement of gold and silver of domestic production deposited at the mints and assay offices of the United States during the year 1872. (Furnished by the courtesy of the Director of the Mint.)

Gold.		Silver.	
Alabama.....	\$910 72	Arizona	\$1, 141 19
Arizona	163, 118 81	Colorado	300, 048 99
California.....	7, 521, 369 35	California	31, 825 30
Colorado.....	1, 124, 837 85	Lake Superior.....	392, 060 24
Georgia.....	40, 966 23	Montana	145, 934 63
Idaho.....	1, 240, 489 19	Nevada	5, 562, 780 93
Montana.....	3, 548, 086 77	North Carolina.....	220 04
Nebraska.....	1, 875 49	New Mexico	82, 665 11
Nevada.....	4, 895, 855 01	Nebraska	342, 463 51
Kansas.....	679 95	Utah.....	524, 765 19
New Mexico.....	82, 626 42	Parted from gold	154, 044 98
Utah.....	38, 540 43	Other sources	30, 991 46
North Carolina.....	120, 350 10		
Oregon.....	399, 065 40		
South Carolina.....	2, 955 06		
Virginia.....	1, 468 23		
Washington.....	2, 841 73		
Wyoming.....	11, 186 44		
Parted from silver	236, 543 99		
Other sources	30, 074 82		
Total	19, 473, 841 99	Total.....	7, 568, 941 57
	7, 568, 941 57		
Aggregate	27, 042, 783 56		

It should be remarked, with reference to the foregoing table, that the States and Territories mentioned as the localities from which gold or silver has been received are not necessarily those in which the precious metals were mined or reduced. The parties depositing bullion for coinage give the locality sometimes of the smelting-works, sometimes of the mines. Occasionally, I believe, the officers of the mint infer, to the best of their knowledge, the locality. At all events, they are quite unable to ascertain the truth of statements made, particularly when mixed lots of bullion from various localities are deposited in the name of a single State or Territory, as a mere matter of form. Thus the silver from Nebraska may be the product of the Omaha reducing-works, or shipments made from points on the Pacific Railroad. The product of any mines in Nebraska it certainly is not. The silver credited to Lake Superior is doubtless wholly or chiefly the product of smelting-works at Wyandotte, Mich., treating mainly ores from the Silver Islet mine, which is not in the United States. The Denver branch mint, which does no coinage,

received during the year \$990,603.09 in gold, and \$17,079.62 in silver, or, in all, \$1,007,682.71. A portion of this bullion may have been re-deposited for coinage at Philadelphia, and hence it may be counted twice in the aggregates of the table. To obtain full information on this point was found impracticable, without an amount of correspondence and minute analysis of the books of the mints and assay offices, for which there was no opportunity.

The following comparative statement of the coinage at the United States branch mint, San Francisco, for 1869, 1870, 1871, and 1872, is taken from the Commercial Herald:

The coinage at the branch mint in this city for 1872, compares with that in 1869, 1870, and 1871, as follows:

	1869.	1870.	1871.	1872.
January.....	\$467,000	\$1,620,000	\$1,570,000	\$840,750
February.....	185,000	985,000	1,171,725	1,210,000
March.....	743,000	2,155,000	965,000	1,127,750
April.....	1,579,000	1,330,000	1,800,000	1,420,000
May.....	985,000	2,083,000	2,178,050	2,020,000
June.....	1,348,000	1,846,000	881,000	666,000
July.....	1,040,000	120,000	2,760,000	2,245,000
August.....	689,500	2,370,000	1,900,000	730,000
September.....	2,550,000	2,030,000	2,210,000	1,264,500
October.....	1,669,300	1,875,000	1,689,000	1,895,000
November.....	1,618,000	1,965,000	1,684,000	1,525,000
December.....	1,459,750	1,676,000	1,218,000	1,436,600
Totals.....	14,363,550	20,355,000	20,026,775	16,380,600

The description of coinage for the twelve months was as follows:

	1871.	1872.
Double eagles.....	\$18,500,000	\$15,600,000
Eagles.....	215,000	173,000
Half-eagles.....	115,000	202,000
Quarter-eagles.....	75,000	55,000
Dollars.....	.....	9,000
Half-dollars.....	1,074,000	290,000
Quarter-dollars.....	7,725	26,250
Dimes.....	32,000	19,000
Half-dimes.....	8,050	36,350
Totals.....	20,026,775	16,380,600

TREASURE PRODUCT, IMPORTS, ETC.

The receipts of treasure from all sources, through Wells, Fargo & Co.'s Express, during the past twelve months, as compared with the same period in 1871, have been as follows:

	1871.	1872.
From northern and southern mines.....	\$35,608,385	\$28,000,270
Coastwise, north and south.....	3,245,431	2,477,978
Imports, foreign.....	4,108,724	8,060,412
Totals.....	42,962,540	38,538,660

MOVEMENT OF COIN IN THE INTERIOR.

The following has been the circulation of coin through Wells, Fargo & Co.'s Express, during 1872:

	To interior.	From interior and coastwise.
January.....	\$1,015,300	\$936,159
February.....	935,472	635,357
March.....	1,251,259	699,944
April.....	1,525,801	568,017
May.....	1,676,637	677,163
June.....	1,249,509	431,301
July.....	1,535,545	764,837

	To interior.	From interior and coastwise.
August	\$2, 044, 643	\$911, 880
September	1, 845, 305	655, 286
October	1, 632, 273	632, 489
November	1, 711, 459	572, 902
December	1, 591, 000	510, 672
In 1872	18, 014, 203	7, 996, 007
In 1871	17, 389, 882	8, 385, 437
Increase	624, 321	-----
Decrease	-----	389, 430

RECEIPTS OF TREASURE.

The following tables comprise the receipts of treasure in this city, through Wells, Fargo, & Co.'s Express, during the year 1872:

From the northern and southern mines.

	Silver bul- lion.	Gold dust.	Coin.	Totals.
1872—January	\$637, 378	\$1, 136, 459	\$752, 516	\$2, 526, 353
February	1, 083, 408	1, 138, 847	539, 205	2, 761, 460
March	458, 656	1, 438, 603	614, 388	2, 511, 647
April	379, 780	1, 446, 487	498, 018	2, 318, 285
May	368, 720	1, 666, 974	608, 400	2, 644, 094
June	692, 502	1, 501, 744	360, 616	2, 554, 862
July	267, 454	1, 760, 855	640, 821	2, 669, 130
August	453, 357	1, 384, 807	835, 554	2, 673, 718
September	866, 402	1, 147, 603	561, 570	2, 575, 645
October	524, 698	742, 028	532, 584	1, 799, 310
November	321, 148	665, 862	418, 748	1, 405, 758
December	333, 221	819, 566	407, 221	1, 560, 008
Total 1872	6, 386, 794	14, 843, 835	6, 769, 641	28, 000, 270
Total 1871	14, 609, 809	13, 872, 648	7, 125, 928	35, 608, 385
Total 1870	14, 152, 984	17, 762, 131	6, 487, 037	38, 402, 152
Total 1869	(*)	(*)	11, 572, 594	44, 045, 445

* Not separated.

From the northern coast.

	Silver bul- lion.	Gold dust.	Coin.	Totals.
1872—January	-----	\$41, 854	* \$131, 602	\$173, 456
February	-----	156, 631	63, 701	220, 332
March	-----	127, 505	46, 615	174, 120
April	-----	126, 604	33, 047	159, 651
May	-----	238, 418	33, 078	271, 496
June	-----	151, 543	28, 826	180, 369
July	-----	196, 407	31, 539	227, 946
August	-----	206, 965	34, 710	241, 675
September	-----	285, 486	35, 087	320, 573
October	-----	277, 050	43, 198	329, 248
November	-----	299, 933	106, 467	406, 400
December	-----	197, 018	74, 019	271, 037
Total 1872	-----	2, 305, 414	661, 889	2, 967, 303
Total 1871	\$9, 785	2, 552, 668	708, 096	3, 270, 549
Total 1870	-----	3, 380, 566	532, 901	3, 913, 467
Total 1869	(*)	(*)	300, 397	2, 958, 458

* Not separated.

From the southern coast.

	Silver bul- lion.	Gold dust.	Coin.	Totals.
1872—January		\$11,458	\$52,041	\$63,499
February		33,382	32,451	65,833
March		26,315	38,941	65,256
April	\$44	21,544	36,952	58,540
May		47,773	35,685	83,458
June		14,583	41,859	56,442
July	1,000	19,287	92,477	112,764
August		43,024	41,616	84,640
September	1,400	6,830	58,629	66,859
October		24,592	56,707	81,299
November		10,895	47,687	58,582
December	1,440	14,566	29,432	45,438
Total 1872	3,884	274,249	564,477	842,610
Total 1871	5,750	347,627	551,413	904,790
Total 1870		399,888	844,548	1,244,436
Total 1869	(*)	(*)	227,000	2,282,571

* Not separated.

In the total receipts from the northern and southern mines for 1871 are included the amounts sent east from the Virginia office; for 1872 they are not. The following shows the comparisons for the twelve months ending December 31, 1871 and 1872:

1871.	Silver bars.
January	\$638,966
February	708,885
March	611,226
April	713,450
May	826,607
June	741,467
July	604,905
August	554,711
September	542,676
October	667,179
November	723,190
December	767,516
Total	8,100,778

1872.	Silver bars.
January	\$530,427
February	185,196
March	838,905
April	1,372,670
May	1,284,905
June	764,134
July	1,040,917
August	569,991
September	286,149
October	695,554
November	652,474
December	1,127,448
Total	9,348,770

The small amount sent in February, this year, is due to the snow-blockade on the railroads.

CURRENCY MOVEMENT.

The annexed table exhibits the interior and coastwise receipts, (Wells, Fargo & Co.,) imports foreign, and exports for the years 1870, 1871, and 1872 :

	1870.	1871.	1872.
Interior receipts	\$42, 874, 746	\$38, 853, 816	\$30, 478, 248
Imports, foreign	5, 466, 883	4, 108, 724	8, 060 412
Total	48, 341, 629	42, 962, 540	38, 538, 660
Exports	32, 983, 140	17, 253, 347	29, 330, 436
Currency movement	15, 358, 489	25, 709, 193	9, 208, 224

COMBINED EXPORTS.

The combined exports, treasure and merchandise, exclusive of over-land railroad, during the past twelve months, as compared with the same time in 1870 and 1871, were as follows:

	1870.	1871.	1872.
Treasure exports	\$32, 983, 140	\$17, 253, 347	\$29, 330, 436
Merchandise exports	17, 848, 160	13, 951, 149	23, 793, 530
Totals	50, 831, 300	31, 204, 496	53, 123, 966

TREASURE EXPORTS.

Our treasure exports for 1872 and the past two years, have been as follows, exclusive of shipments through United States mail:

	1870.	1871.	1872.
To New York	\$13, 443, 295 02	\$8, 057, 279 33	\$4, 055, 565 46
To England	9, 790, 631 10	3, 184, 841 74	2, 262, 302 25
To France	190, 408 24	.....	.....
To China	5, 496, 856 22	3, 443, 208 72	7, 476, 862 72
To Japan	1, 383, 669 77	738, 412 67	10, 212, 949 63
To Panama	255, 497 20	115, 146 49	56, 679 82
To other countries	2, 422, 782 49	1, 714, 458 16	5, 266, 075 76
Totals	32, 983, 140 04	17, 253, 347 11	29, 330, 435 64

The comparative description of our exports of treasure by the above table was as follows:

	1870.	1871.	1872.
Gold bars	\$8, 345, 549	\$3, 566, 535	\$11, 910, 565
Silver bars	11, 968, 477	8, 663, 944	7, 913, 391
Gold coin	9, 131, 923	3, 028, 100	7, 888, 620
Mexican dollars	3, 492, 606	1, 872, 184	1, 427, 441
Gold dust	30, 801	37, 514	37, 007
Legal tender	12, 284	.....	.....
Silver coin	500	85, 070	153, 412
Totals	32, 983, 140	17, 253, 347	29, 330, 436

The following table shows the value and destination of treasure-shipments from this port during the past sixteen years, from 1857 to 1872, inclusive:

Years.	Eastern ports.	England.	China.	Panama.	Other ports.	Totals.
1857	\$35,531,778	\$9,347,743	\$2,993,264	\$410,929	\$632,978	\$48,976,692
1858	35,891,236	9,265,739	1,916,007	299,265	175,779	47,548,026
1859	40,146,437	3,910,930	3,100,756	279,949	203,390	47,640,462
1860	35,719,296	2,672,936	3,374,680	300,819	258,185	42,325,916
1861	32,628,011	4,061,779	3,541,279	349,769	95,920	40,676,758
1862	26,194,035	12,950,140	2,660,754	434,508	322,324	42,561,761
1863	10,389,330	28,467,256	4,206,370	2,503,296	505,667	46,071,920
1864	13,316,122	34,436,423	7,888,973	378,795	686,888	56,707,201
1865	20,583,390	15,432,639	6,963,522	1,224,845	1,103,832	45,308,227
1866	29,244,891	6,532,208	6,527,287	511,550	1,548,457	44,364,393
1867	23,355,903	5,841,184	9,031,504	372,752	3,075,149	41,676,722
1868	21,468,800	5,212,979	6,193,995	640,000	1,828,621	35,444,395
1869	12,459,813	11,841,812	6,487,445	658,182	5,839,865	37,287,117
1870	13,443,295	9,790,631	5,496,856	255,497	3,996,861	32,983,140
1871	8,057,279	3,184,842	3,443,209	115,146	2,452,871	17,253,347
1872	4,055,565	2,262,302	7,476,863	56,680	15,479,026	29,330,436
Totals	362,485,181	165,311,543	81,302,764	8,791,782	38,259,813	656,151,083

EXPORTS OF TREASURE.

Statement of the amount of treasure exported from San Francisco, through public channels, to eastern domestic and foreign ports during the year 1872, exclusive of shipments through United States mail:

To New York.

January	\$304,960 42
February	274,014 61
March	578,040 53
April	364,661 09
May	338,241 44
June	394,712 06
July	284,001 04
August	121,845 94
September	89,385 29
October	205,267 01
November	354,685 78
December	745,750 25
	<u>\$4,055,565 46</u>

To England.

January	235,746 69
February	383,365 89
March	283,130 55
April	239,235 55
May	275,997 48
June	133,906 66
July	91,647 96
August	167,350 65
September	40,845 67
October	52,839 43
November	152,680 68
December	205,555 04
	<u>2,262,302 25</u>

To China.

January	428,578 67
February	485,744 17
March	778,923 26
April	573,644 27
May	692,284 87
June	524,440 80
July	379,736 52
August	1,134,049 52
September	289,685 84
October	891,548 69
November	1,018,275 47
December	279,950 64
	<u>7,476,862 72</u>

To Japan.

January	\$637,588 99	
February	100,281 13	
March	653,887 31	
April	300,071 61	
May	1,837,657 68	
June	99,946 63	
July	1,400,707 52	
August	4,633,571 28	
September	256,581 66	
October	250,037 00	
November	42,618 82	
		\$10,212,949 63

To Callao.

March	500,000 00	
April	1,000,000 00	
May	500,000 00	
June	1,000,000 00	
July	1,547,902 60	
		4,547,902 60

To Manila.

February		170,000 00
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To Panama.

February	3,452 22	
March	5,000 00	
April	5,000 00	
May	15,000 00	
June	10,000 00	
November	658 72	
December	17,568 88	
		56,679 82

To Central America.

January	76,505 24	
February	86,783 00	
March	20,069 50	
April	30,000 00	
May	8,168 17	
July	15,000 00	
August	21,326 74	
September	8,720 00	
October	6,150 50	
November	3,540 00	
December	17,676 00	
		293,939 15

To Iloilo, (Philippine Islands.)

March		23,963 79
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To Mexico.

June	5,000 00	
August	28,900 00	
October	15,000 00	
November	1,000 00	
December	5,000 00	
		54,900 00

To Valparaiso.

July	102,279 28	
August	50,090 94	
		152,370 22

To Honolulu.

November	20,000 00	
December	3,000 00	
		23,000 00

Total for 1872	29,330,435 64
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Total for 1871	17,253,347 11
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Increase this year	12,077,088 53
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MINING DIVIDENDS FOR 1872.

[Compiled from San Francisco papers.]

During the year thirteen mining companies paid dividends amounting in the aggregate to \$6,731,100, and distributed as follows:

Name of mining company.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Belcher	\$104,000	\$156,000	\$156,000	\$208,000	\$312,000	\$312,000	\$312,000	\$312,000	\$312,000	\$12,000	\$12,000	\$12,000	\$2,184,000
Cederberg	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	36,000
Chollar Potosi	120,000	180,000	180,000	300,000	480,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	56,000
Crown Point	20,000	7,500	10,000	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	1,860,000
Eureka .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,000	40,000
Keystone Quartz .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30,000
Mahogany .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15,000
Meadow Valley .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	360,000
North Star	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	27,000
Pioche .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40,000
Providence .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,100
Raymond & Ely	90,000	.....	150,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	150,000	2,070,000
Yule Gravel .....	.....	.....	.....	5,000	5,000	.....	.....	.....	.....	.....	.....	.....	10,000
Total.....	371,000	380,500	595,000	820,500	1,067,000	882,000	847,000	557,000	522,000	222,000	225,100	242,000	6,731,100

The foregoing dividends compare as follows with the dividends paid by 18 mining companies during the previous year:

	1871.	1872.
January	\$537,000	\$371,000
February	587,000	385,000
March	554,500	595,000
April	517,600	820,500
May	407,550	1,067,000
June	308,300	882,000
July	363,300	847,000
August	359,300	557,000
September	344,400	522,000
October	298,000	222,000
November	280,500	225,100
December	280,500	242,000
Totals.....	4,837,950	6,731,100

San Francisco coal trade for 1871 and 1872.

[From the Commercial Herald of January 17, 1873.]

IMPORTS.

	1871. Tons.	1872. Tons.	Increase. Tons.	Decrease. Tons.
Foreign:				
Australian	38,942	115,332	76,390	.....
English	54,191	29,190	.....	25,001
Vancouver	15,621	26,008	10,387	.....
Chili	4,164	3,682	.....	482
Eastern:				
Anthracite	7,231	19,618	12,387	.....
Cumberland	6,060	10,051	3,991	.....
Domestic:				
Mt. Diablo	133,485	177,232	43,747	.....
Coos Bay	28,690	32,562	3,872	.....
Bellingham Bay	20,284	4,100	.....	16,184
Seattle	4,918	14,830	9,912	.....
Rocky Mountain	1,025	1,862	837	.....
Total.....	314,611	434,467	161,523	41,667

Specified on the way from domestic Atlantic ports, December 31—

	1870.	1871.	1872.
Tons.....	2,464	3,679	3,799
Casks.....	890	885	819

We give above our imports and production for the past year in detail, with our usual biennial comparison of amounts, merely noting here that, from the receipts of 1871, we have eliminated some 583 tons from Queen Charlotte's Island and Sitka, being merely experimental shipments and not belonging to our regular sources of supply. In reviewing the operations of the year, it will be observed that the imports of foreign coal, as well as the production of our domestic varieties, have been altogether without precedent, and they seem to have shared to the fullest extent the remarkable impetus which has characterized all of our industrial and commercial pursuits during the period under review. And what perhaps is equally remarkable, prices have been maintained throughout the year with great firmness, and, indeed, all of our domestic varieties have been very materially advanced. The very heavy foreign import is doubtless due to some extent to the large fleet seeking our extraordinary grain crop, but in consequence of our increased ocean steamship service it has been mostly brought on orders, or taken to

arrive at full prices, and, in view of the probable further increase in this element of our commerce, the consumption for the future must necessarily be large, and as both coal and freights have materially advanced in all parts of the world, we can scarcely look for much abatement here as to prices. As regards our domestic coals, we note also a very general increased production, Bellingham Bay being the only exception, in consequence of interruption of work at the mine for the first nine months of the year. We learn, however, that it is again in complete working order, and is sending its usual quota of coal to the market, and has considerably advanced the price. The increase of Mt. Diablo is especially noticeable, this increase alone being more than the entire production of this variety some eight years ago. And as the consumption of this coal is particularly identified with our coasting trade and inland navigation, as well as our various manufacturing pursuits, it indicates a very gratifying activity during the past year in all these branches of industry. Present price, \$6.50 and \$8.50 for fine and coarse, respectively. We give below our usual five year comparative statement, which will indicate at a glance the increased consumption of the several varieties:

	1868. Tons.	1869. Tons.	1870. Tons.	1871. Tons.	1872. Tons.	Totals.
Foreign.....	93,000	109,000	135,168	113,483	174,212	624,863
Eastern.....	32,700	38,600	30,820	13,291	29,669	145,080
Domestic.....	157,000	184,100	167,183	188,420	230,586	927,289
Total.....	382,700	331,700	333,171	315,194	434,467	1,697,232

As the import of foreign coals is, to a considerable extent, controlled by the course of tonnage and to some degree affects the consumption of other varieties, the comparative variations between consecutive years do not, perhaps, indicate so accurately the steady increase and average consumption as a statement of the annual consumption at given periods. We accordingly give below this consumption, at periods of five years, for the past fifteen years:

Year.	Foreign.	Eastern.	Domestic.	Total.
1858.....	29,071	30,753	3,755	63,579
1863.....	43,480	36,660	47,820	127,960
1867.....	63,700	62,230	124,320	250,250
1872.....	174,212	29,669	230,586	434,467

	Total tons increase of domestic coals.	Average annual in- cr'ee of domestic.	Total tons increase of all kinds.	Average annual in- cr'ee of all kinds.
1859 to 1863, inclusive.....	44,065	8,813	64,381	12,478
1864 to 1868, inclusive.....	76,500	15,300	122,290	24,458
1869 to 1872, inclusive.....	106,266	25,253	184,217	46,054

The sales of Coos Bay in this city from the Eastport mine during the past year were 20,000 tons. The mine is in complete order, mining 80 to 90 tons per day, but capable of turning out 200 tons every twenty-four hours with present machinery and facilities. The quality has steadily improved the farther the tunnels are extended and the deeper they go. The mine is situated (by railroad) three-quarters of a mile from the water, the grade is easy, discharging the coal directly on board vessels. Nearly the entire amount brought to market has been used for domestic purposes, being highly appreciated. The demand has been constantly in excess of the supply. The coal is of such a nature and so comes to market that it is all received from the wharf as discharged, nothing being rejected as screenings or wastage. The supply the past season was considerably curtailed by a strike of the miners, the owners prefer-

ring to suspend operations until the strikers would accept their former rates of wages. The property of the company covers some 1,700 acres, and, judging from present indications, there is no limit to the supply. The deposit is very regular, with no indications of faults or dislocations in the seams, and the amount which this mine can be made to furnish is practically only dependent upon the demands of the market and the means of transporting it at remunerative rates. A steamer is now nearly completed for the purpose of bringing this coal to market, and of affording regular communication with Coos Bay, with the probability of others soon following in the same business, and with the same owners. This company has during 1872 paid regular monthly dividends of one per cent. on the par value of the capital stock. The average price of Coos Bay from ship's side during 1872 was \$11; present cargo rate, \$12. The supply of Seattle coal is steadily increasing, and is largely used for household purposes; present cargo price, \$13 to the trade. The market for Australian, anthracite, Cumberland, and English is exceedingly quiet, and withal stocks are ample, dealers carrying more than their usual supplies, besides showing no disposition at this date to make further purchases, owing to the very considerable quantity *en route*. A cargo of Cumberland from Baltimore, per ship C. A. Farwell, has been stored.

Annual receipts of coal at San Francisco from 1860 to 1872.

Years.	Mount Dia- blo, tons.	Coos Bay, tons.	Bellingham Bay, tons.	Vancouver Is- land, tons.	Chili, tons.	Australia, tons.	English, tons.	Cumberland, tons.	Anthracite, tons.	Queen Char- lotte Island, tons.	Sitka, tons.	Seattle, tons.	Rocky Mount- ain, tons.	Saghalie, tons.	Fuca Straits, tons.	Total tons.
1860		3,145	5,490	6,655	1,900	7,850	6,640	5,970	39,985	.....	.....	.....	.....	.....	.....	77,635
1861		4,630	10,055	6,475	12,495	23,370	23,565	2,975	26,060	.....	.....	.....	.....	.....	.....	116,245
1862		2,815	10,050	8,870	5,110	12,590	16,055	4,970	36,685	.....	.....	.....	.....	.....	.....	120,545
1863		1,185	7,750	5,745	1,790	16,890	14,660	5,670	38,660	.....	.....	.....	.....	.....	.....	135,550
1864		1,200	11,845	12,785	2,323	21,160	18,330	7,275	41,680	.....	.....	.....	.....	.....	.....	167,298
1865		1,500	14,446	18,181	1,410	17,610	9,655	4,230	22,585	.....	.....	.....	.....	.....	.....	150,147
1866		2,120	11,380	10,852	1,480	53,700	7,400	9,524	12,124	.....	.....	.....	.....	.....	.....	192,601
1867		5,415	8,899	14,829	14,949	26,619	7,302	12,177	48,518	.....	.....	.....	.....	218	509	248,925
1868		10,521	13,866	23,348	8,511	31,590	29,561	2,292	39,592	.....	.....	.....	.....	204	.....	282,025
1869		14,824	20,552	14,880	1,114	75,115	17,386	11,536	24,844	.....	.....	.....	.....	.....	.....	328,973
1870		20,567	14,355	12,640	7,350	83,982	31,196	9,322	21,320	.....	.....	.....	.....	.....	.....	320,493
1871		28,690	20,284	15,621	4,161	38,942	54,191	6,060	7,231	565	18	4,918	1,025	.....	.....	315,194
1872		32,562	4,100	26,008	3,682	115,332	29,190	10,051	19,618	.....	.....	14,830	1,862	.....	.....	434,467

Product of quicksilver during 1870, 1871, and 1872.

[From the Commercial Herald of January 17, 1873.]

	1870. Flasks.	1871. Flasks.	1872. Flasks.
New Almaden mine.....	14,000	18,763	17,753
New Idria mine.....	10,000	9,227	8,597
Redington mine.....	4,546	2,128	2,456
And sundry other mines.....	1,000	1,763	1,500
Totals.....	29,546	31,881	30,306

The exports to the different countries for 1872 and the three previous years were as follows :

To—	1869.	1870.	1871.	1872.
New York.....	1,500	1,000	800	1,202
China.....	11,600	4,050	7,900	4,810
Mexico.....	8,060	7,088	3,081	5,038
South America.....	2,900	1,300	2,200	1,300
Australia.....	300	300	1,100	643
British Columbia.....	4	9	6	2
Other countries.....	51	41	118	103
Total flasks.....	24,415	13,788	15,205	13,098

And our exports previously have been :

	Flasks.
In 1868.....	44,506
In 1867.....	28,853
In 1866.....	30,287
In 1865.....	42,469
In 1864.....	36,927
In 1863.....	26,014
In 1862.....	33,747
In 1861.....	35,995
In 1860.....	9,448
In 1859.....	3,399
In 1858.....	24,142
In 1857.....	27,262
In 1856.....	23,740
In 1855.....	27,165
In 1854.....	20,963
In 1853.....	12,737
In 1852.....	900

The price of this staple ruled uniformly high during the past year, say 85 to 87½ cents, but at this writing is advanced to 90 cents. The production varies little from that of 1871, as will be seen on reference to the tables annexed. The export value was in 1871, \$836,038; and in 1872, \$861,715.

SALT.

Imports :	1871.	1872.
Tons.....	6,949	2,403
Sacks.....	22,005	7,680
Cases.....	307	525
Exports :		
Tons.....	177	627
Bags.....	440	457

The market has been liberally supplied all the year past with Liverpool and other foreign. This, coupled with a local supply, has kept down prices to a rate barely covering cost and charges. At this date there is very little business doing from first hands. Holders of Liverpool firm at \$23 to \$24 for fine stoved; coarse at \$19 to \$20; California, \$12 to \$15; Mexican, \$14 to \$15; San Francisco Bay, \$5 to \$8 for common.

METALS.

Imports:	1871.	1872
Iron, pig, tons.....	5,399	13,138
Iron, bar, bars.....	99,147	276,693
Iron, plate, pieces.....	6,734	30,961
Iron, various, bundles.....	55,508	20,450
Iron, various, cases.....	1,054	1,237
Iron, various, pieces.....	45,502	13,042
Tin, plate, boxes.....	32,283	50,082
Steel, cases.....	1,311	1,782
Steel, bundles.....	5,202	8,118
Sheathing-metal, cases.....	132	506

The importation of lead has ceased entirely, in consequence of the production of that article here, which not only supplies the local want, but has furnished 5,000 tons for export in the year 1872. The Selby Lead and Silver Smelting Company are in operation constantly, but for only half the capacity of the works. The manufacturing of sheet-lead, pipe, and shot has been successful, supplying the whole want of the coast. But the proprietors, however, complain that this is a small market, and the demand as yet quite limited. Prices same as last year. There has been a brisk trade in bar, plate, and sheet irons: the supply equal to the demand. The amount of stock now on hand is larger than it was last year at this date. The prospects of liberal importations for the present year are very good. In regard to pig-iron the annual circular of Wm. Jeffray gives a succinct account of the year's business. The monthly quotations given below will show that the market has been of a very fluctuating character during the year. The small stock on hand at the beginning of 1872, combined with the very material advance on iron in England, caused prices to advance from \$50 to \$80 per ton, within a period of five months from the beginning of the year. Large shipments being made in the early part of the season, were freely bought up "to arrive" as soon as shipped, ranging from \$50 to \$57.50, the advance being anticipated; but when these arrivals began to come to hand, prices gradually declined. The importations have been heavy, and a large amount of scrap-iron brought into requisition in city and country, occasioning a material saving on account of the high prices of pig-iron; while few buildings have been constructed, which leaves a large excess of stock on hand at present over last year at this time. Closing price, in the absence of any important sales for some time, nominally \$52.50. The following are the ruling monthly quotations for the past year:

SCOTCH SOFT.

January.....	\$52 00 steady.
February.....	55 00 to 57 00
March.....	56 00 to 60 00
April.....	70 00 to 75 00
May.....	70 00 to 80 00
June.....	75 00 to 80 00
July.....	70 00 steady.
August.....	54 00 to 57 50
September.....	55 00 to 57 50
October.....	50 00 to 55 00
November.....	52 00 to 55 00
December.....	50 00 to 52 00

ENGLISH AND AMERICAN WHITE.

January.....	\$50 00 steady.
February.....	55 00 steady.
March.....	55 00 steady.
April.....	60 00 steady.
May.....	65 00 steady.
June.....	65 00 steady.

July.....	\$52 50 to \$55 00
August.....	55 00 steady.
September.....	52 50 steady.
October.....	52 50 steady.
November.....	52 50 steady.
December.....	52 50 steady.

The stock of pig-iron on hand January 1, 1873, was 8,571 tons—7,463 tons soft, and 1,108 tons white—almost 3,000 tons in excess of the amount on hand at the same period last year. Shipments at present on the way will foot up nearly 3,000 tons, which, added to the supplies on hand, leaves little room for further shipments at present. Stock of pig-iron on hand January 1, 1872, 5,637 tons; importations of pig-iron for the year 1872, soft, 12,238 tons; white, 930 tons—13,168 tons; total, 18,805 tons. Detailed account of stock on hand January 1, 1873: In importers' hands, Scotch soft, 2,985 tons; English white, 270; American white, 190; in foundrymen's and jobbers' hands, Scotch soft, 4,478 tons; English white, 548; American white, 100—8,571 tons; consumption of 1872, (white, 1,449; soft, 8,785,) 10,234 tons. The above synopsis shows the consumption of 1872 to be 2,275 tons less than 1871, and the importations of the year to be 7,669 tons in excess of 1871. We do not believe there has been any actual falling off in the iron consumption during the year, but the use of all the old scrap-iron in the State and on the coast has been very considerable, thus displacing so much pig-iron; but now the whole Pacific slope has been scoured for old scrap-iron, and the accumulations of scores of years used up, so that in the future there will be nothing to fall back upon, and the consumption of 1873 will show a large increase. The stock of tin-plate, sheet-zinc, &c., is light for the season.

GUNPOWDER.

Imports:	1871.	1872.
Eastern, kegs	37, 120	32, 368
Eastern, cases.....	3, 575	4, 006
Eastern, packages.....	830	.....
California, kegs.....	108, 388	122, 954
California, cases.....	2, 439	2, 073
Exports:	1871.	1872.
Kegs	6, 509	5, 519
Cases.....	275	431
Specified on the way:		
December 31.	1871.	1872.
Kegs.....	.....	.....
Packages	11, 361	9, 282

The competition between California and eastern blasting, &c., is continued, prices uniform at \$3 per keg. The California Powder Works made, in 1872, 120,000 kegs blasting and 15,000 packages sporting. The Hazard and Dupont companies decline to make any exhibit. The Giant Powder Company report their product at 50,000 pounds monthly during 1872, making two qualities—No. 1 at \$1, and No. 2 at 50 cents per pound—having a market for the same in all the States and Territories east of the great rivers, Mexico, British Columbia, and the Sandwich Islands. The business was inaugurated in 1868, and the sales have each year increased over 100 per cent. The company owns the patent-right for the whole United States, and supplies the Eastern States from its works in New Jersey.

500 MINES AND MINING WEST OF THE ROCKY MOUNTAINS.

Highest and lowest prices of mining

[From the San Fran

Name of company.	January.		February.		March.		April.		May.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Alps			\$8 00	\$5 25	\$7 50	\$5 25	\$6 12½	\$5 00	\$5 25	\$2 00
Alpha	\$30 00	\$14 00	53 00	2 00	40 50	29 00	240 00	42 50	170 00	40 00
Alpine					7 50	7 00				
American Flag			17 00	11 00	17 75	11 50	24 00	14 50	22 50	13 50
Arizona and Utah			6 00	3 00	5 00	2 50	12 00	3 12½	6 00	1 75
Adams Hill			4 00	3 50	4 00	2 00	5 00	3 00	4 00	2 00
Amador		287 00	327 00	303 00	580 00	280 00	300 00	300 00		
American Flat									4 00	4 00
Amazon										
Buckeye	3 50	3 00	5 00	3 25	6 25	4 00	14 50	8 50	12 00	2 00
Bacon					40 00	40 00	95 00	40 00	90 00	45 00
Baltimore					2 00	2 00	9 00	2 00	7 50	1 75
Baltimore American							9 50	6 50	12 00	2 00
Belcher	455 00	6 50	775 00	597 00	645 00	510 00	1,525 00	645 00	1,400 00	675 00
Bellevue			22 50	13 00	22 00	16 00	18 00	6 00	9 50	5 00
Bowery					19 00	8 00	15 00	12 00	12 00	3 75
Bullion							100 00	100 00	50 00	50 00
Bowers							45 00	30 00	25 00	8 00
Belmont							13 00	11 00	11 00	5 50
Best & Belcher										
Caledonia			21 00	10 00	21 00	9 00	145 00	18 00	125 00	55 00
Calaveras							6 00	5 00	5 50	5 00
Chapman					5 00	4 00	3 00	3 00		
Chollar Potosi	48 00	33 50	86 00	47 50	73 00	52 00	380 00	65 50	275 00	70 00
Crown Point	620 00	450 00	800 00	640 00	900 00	660 00	1,500 00	990 00	1,825 00	100 00
Consolidated Virginia	27 00	16 00	55 00	21 00	47 00	30 00	160 00	45 50	128 00	20 00
Confidence	15 00	15 00	40 00	40 00			185 00	70 00	205 00	70 00
Consolidated Chloride										
Consolidated Silver Wedge					1 85	80				
Central							40 00	10 00	20 00	3 75
Central No. 2									10 00	3 00
Chief of the Hill									5 00	5 00
Cook & Geyer									5 00	2 00
Condor									3 50	3 50
Consolidated Gold Hill									10 00	10 00
Cottonwood Creek Gold Mining Company							7 00	5 50	5 50	5 50
Daney	7 50	2 75	3 00	1 87½	4 00	2 00	9 75	3 25	6 50	2 50
Dardanelles							21 00	20 00	20 00	3 00
Eclipse							25 00	16 00	21 00	5 50
Eureka	23 00	17 50	21 00	16 75	23 00	15 00	18 50	16 00	20 00	15 00
Eureka Consolidated	26 75	23 00	27 50	23 00	30 00	22 37½	41 00	26 25	36 00	25 50
Empire Mill										
Exchequer			20 00	10 00	19 00	15 00	90 00	17 00	80 00	24 00
Excelsior			19 00	10 50	100 00	15 00	160 00	19 50	16 00	11 00
Flowery			103 00	86 00					3 00	3 00
Francis					5 00	5 00			5 00	2 00
Globe			5 00	3 00	5 25	2 00	14 00	3 25	7 50	1 50
Gould & Curry	140 00	107 00	350 00	113 00	250 00	164 00	560 00	245 00	510 00	90 00
Gold Hill Quartz			19 00	19 00						
General Lee			10	50	80	70	60	15	50	25
Gillis									2 50	2 50
Golden Chariot	28 00	13 50	18 00	11 50	23 00	12 00	25 00	16 00	16 50	11 00
Hale & Norcross	199 00	134 00	315 00	165 00	350 00	237 00	750 00	315 00	380 00	70 00
Hidden Treasure Consolidated										17 00
Hudson			3 25	3 25	3 75	3 50				190 00
Huhn & Hunt	19 75	14 00	18 00	13 00	5 00	1 75	2 75	1 62½	7 00	1 00
Hermes					5 00	5 00				
Highland Chief									23 00	5 00
Ida Ellmore					15 00	11 00	28 00	13 00	22 00	17 00
Imperial	72 50	40 00	130 00	57 00	156 00	85 00	480 00	162 00	425 00	200 00
Independent	3 75	3 00	15 00	3 00	10 00	6 25	7 25	3 50	3 75	11 00
Ingomar					4 25	3 25	4 00	2 50	3 00	7 00
Ivanhoe									5 00	
Jackson	1 75	1 00	1 12½	1 00	1 00	50	1 75	65	2 25	5 00
Julia	13 50	4 00	13 00	6 00	9 00	7 00	26 00	7 25	25 50	
Justice	4 75	2 00	5 00	4 00	10 50	5 00	47 50	7 00	35 00	1 00
Kentuck	205 00	143 00	280 00	190 00	295 00	220 00	610 00	270 00	700 00	2 50
Knickerbocker			3 50	2 00	2 75	2 00	16 00	2 25	14 50	1 00
Lehigh							2 87½	2 62½		18 00
Lillian Hall			2 25	1 50	1 50	1 25	1 37½	1 00	1 00	
Lady Bryan							9 00	5 00	8 00	13 00

Highest and lowest price of mining stocks

Name of company.	January.		February.		March.		April.		May.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Mammoth	\$0 55	\$0 40	\$0 70	\$0 40	\$0 80	\$0 65	\$1 10	\$0 60	\$2 25	.....
Mahogany	24 00	15 00	15 50	9 00	18 00	9 50	23 00	15 50	28 50	.....
Maxwell .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	\$2 50
Meadow Valley	26 00	16 00	19 00	15 50	24 00	17 50	27 50	16 50	18 00	.....
Meadow Valley, west extension .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mineral Hill .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Minnesota .....	.....	.....	4 25	2 50	4 25	3 00	5 75	3 50	4 75	4 00
Metropolitan Mill and Mining Company .....	.....	.....	1 37½	60	.....	.....	.....	.....	.....	.....
Mount Jefferson .....	.....	.....	.....	.....	2 50	1 00	.....	.....	.....	65
Monitor and Magnet .....	.....	.....	.....	.....	8 00	3 00	.....	.....	.....	.....
Murphy .....	.....	.....	.....	.....	.....	.....	5 00	4 00	5 00	2 00
Mocking-bird .....	.....	.....	2 50	1 50	7 00	3 00	8 25	6 00	.....	2 00
North Oro Fino .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Noonday .....	.....	.....	50	50	75	75	80	60	90	21
Nevada Butte .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York Consolidated .....	.....	.....	.....	.....	.....	.....	12 00	10 00	10 00	.....
Newark .....	.....	.....	.....	.....	.....	.....	15 00	15 00	16 50	10 00
Occidental .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ophir	65 00	37 00	125 00	53 00	98 00	35 00	140 00	69 00	123 00	49 00
Oakville Quartz Mining Company .....	.....	.....	10 50	10 00	6 00	6 00	.....	.....	.....	3 12½
Original Hidden Treasure	8 75	6 25	8 00	7 00	13 00	7 75	21 50	12 00	17 00	9 50
Overman	53 00	30 00	75 00	41 00	66 00	46 00	270 00	65 00	205 00	50
Phenix	6 00	4 50	6 00	4 00	5 25	4 00	5 25	4 00	5 25	1 00
Peter Walter .....	.....	.....	4 00	3 00	6 00	6 00	3 00	3 00	.....	75
Pioche	14 50	9 25	4 00	10 00	19 00	11 00	19 00	14 50	17 00	1 25
Pictou .....	.....	.....	.....	.....	.....	.....	3 50	3 00	2 50	2 00
Phil. Sheridan .....	.....	.....	.....	.....	.....	.....	.....	.....	3 50	.....
Peavine .....	.....	.....	.....	.....	.....	.....	1 50	1 00	1 00	.....
Pioche, West Extension .....	.....	.....	2 50	2 50	4 00	4 00	4 00	3 50	1 50	4 00
Page & Panaca .....	.....	.....	3 75	2 37½	2 37½	1 75	3 25	1 00	3 00	.....
Pauper .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Raymond & Ely	120 00	83 50	140 00	108 00	139 00	124 00	132 00	103 00	137 00	100 00
Rising Star .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15 00
Rock Island .....	.....	.....	.....	.....	.....	.....	5 25	5 00	5 00	5 00
Savage	70 00	48 50	310 00	61 50	260 00	205 00	725 00	240 00	595 00	.....
Segregated Belcher	65 00	32 50	81 00	50 00	75 00	50 00	290 00	74 00	200 00	.....
Sierra Nevada	28 00	23 00	35 00	21 00	35 00	24 00	59 00	29 00	50 00	.....
Silver Hill .....	.....	.....	2 00	1 50	6 00	3 00	20 00	17 00	15 00	20 00
Silver Wave .....	.....	.....	.....	.....	.....	.....	3 50	3 25	.....	2 75
Silver Vault .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 00
Silver Peak .....	.....	.....	.....	.....	8 00	3 00	7 50	6 75	.....	2 00
Saint Patrick Gold Mining Company	46 00	46 00	30 00	16 00	21 00	20 00	25 00	20 00	20 00	2 00
Star Consolidated .....	.....	.....	.....	.....	.....	.....	3 50	3 00	6 00	5 00
Starlight .....	.....	.....	.....	.....	.....	.....	.....	.....	3 12½	3 00
Saint Lawrence .....	.....	.....	.....	.....	.....	.....	.....	.....	3 25	.....
Sigler .....	.....	.....	.....	.....	.....	.....	.....	.....	3 00	.....
Succor	5 62½	3 25	9 00	3 62½	6 25	4 62½	13 00	5 00	8 00	6 00
South Chariot .....	.....	.....	4 12½	2 25	20 00	2 25	5 25	3 50	4 50	1 50
South Eureka .....	.....	.....	.....	.....	25	25	.....	.....	.....	7 00
South Emma .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 00
Senator .....	.....	.....	.....	.....	.....	.....	.....	.....	6 00	1 75
South Overman .....	.....	.....	.....	.....	.....	.....	.....	.....	1 75	.....
Spring Mount .....	.....	.....	.....	.....	.....	.....	.....	.....	5 00	4 00
Trench .....	.....	.....	.....	.....	.....	.....	23 00	18 00	19 00	2 50
Taylor .....	.....	.....	2 25	2 25	3 12½	3 00	3 25	2 50	1 75	.....
Union Mill and Mining .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union Consolidated .....	.....	.....	.....	.....	.....	.....	.....	.....	6 50	2 75
Utah .....	.....	.....	.....	.....	.....	.....	14 00	8 00	10 00	5 50
Virginia .....	.....	.....	3 50	3 00	6 00	2 00	.....	.....	.....	9 87½
Virtue	5 75	5 50	6 00	4 50	11 00	6 00	10 50	.....	4 00	.....
Washington and Creole .....	.....	.....	.....	.....	7 25	5 00	7 50	5 00	6 75	5 00
War Eagle .....	.....	.....	.....	.....	.....	.....	.....	.....	9 00	.....
Ward Beecher .....	.....	.....	8 00	5 50	8 00	5 50	13 00	6 50	10 00	.....
Wellington .....	.....	.....	.....	.....	5 50	4 00	6 00	4 75	5 25	.....
Woodville .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellow Jacket .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yule Gravel	69 50	60 00	91 00	61 00	88 00	71 00	300 00	82 50	325 00	100 00

for the past twelve months.—Continued.

June.		July.		August.		September.		October.		November.		December.	
Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
\$1 75	\$0 50	\$2 50	\$1 00	\$0 50	\$0 50	\$0 60	\$0 35	\$0 35	\$0 35	\$0 50	\$0 25	\$0 60	\$0 30
24 00	17 00	1 00	45	16 50	11 50	12 50	5 00	9 25	5 00	16 00	8 87½	12 00	8 00
16 00	14 50	22 00	13 00	31 00	15 75	34 75	19 25	30 00	23 25	27 50	20 00	20 00	17 00
		20 00	15 00										
2 50	1 25			2 00	1 00	1 25	50	1 50	87½	1 12½	50	1 75	50
		2 75	2 00										
1 00	1 00	1 00	1 00										
3 00	1 00			2 12½	2 00	2 12½	1 25	1 00	1 00			15	15
		3 00	2 00										
		3 00	3 00			21		25	25	35	05	60	35
		20	10										
3 00	1 00			2 00	1 00	1 50	1 00	1 25	90	2 50	1 00	2 00	1 50
5 00	3 00	1 37½	1 00	5 12½	7 12½	9 00	4 50	7 25	3 50	6 50	4 00	4 25	2 50
		2 50	2 25	2 00	1 6½	3 00	1 50	1 50	1 50	2 50	1 37½	2 00	1 75
38 00	21 00	4 00	4 00	46 00	33 00	78 00	34 00	76 00	50 00	63 50	49 50	54 00	34 00
		56 00	31 00							4 00			
13 50	9 00	3 50	3 50	6 50	4 25	6 50	4 25	5 50	2 75	6 37½	3 00	5 00	4 00
93 00	58 00	11 00	6 25	87 50	65 00	75 00	57 00	95 00	46 00	82 50	70 00	79 00	55 00
4 50	3 87½	110 00	74 00	5 00	4 12½	4 00	3 87½	4 50	2 00	4 50	2 25	3 00	1 75
50	50	5 00	3 50										
16 00	13 00			36 50	27 62½	31 50	17 50	18 00	14 00	17 00	9 00	11 00	7 00
30	25	49 50	15 50			50		35	20	50	35	50	25
		25	25	1 12½	75	75						25	25
75	75	1 50	1 50	1 37½	1 12½	1 33½	90	1 00	50	1 25	55	1 50	65
1 00	1 00	1 50	40	2 00	1 12½	5 50	3 37½	5 25	4 25	2 00		1 75	1 50
2 50	2 00	1 75	1 50	2 75	2 00	3 62½	2 00	2 62½	1 87½	2 75	2 00	4 50	2 00
		2 37½	1 50	2 00	2 00	2 00	2 00	3 00	1 50				
139 00	114 00	158 00	134 00	175 00	148 00	181 00	151 00	160 00	128 00	145 00	91 00	109 00	73 00
										75	50		
185 00	122 00			170 00	85 00	153 00	84 00	113 00	79 00	110 00	73 00	88 00	55 00
107 00	52 00	226 00	130 00	126 00	75 00	91 00	63 00	87 00	49 00	90 00	70 00	80 00	57 50
19 00	14 00	130 00	82 00	16 37½	11 00	18 00	13 00	18 75	14 00	17 00	14 50	15 75	13 50
7 50	6 00	19 00	15 50	7 25	5 00	9 50	1 00	9 75	6 50	9 75	1 62½	8 75	7 00
		9 00	6 00			50	50						
						4 00		6 50	5 25	7 12½	2 50	3 00	62½
10 00	5 00					12 50	12 00			5 00			
3 00	1 25			1 37½	1 00	75	50	50	40				
		1 50	75					1 00	1 00				
5 25	3 50			5 00	4 00	4 50	3 00	4 50	2 50	4 50	3 00	1 25	1 00
6 50	2 75	5 12½	3 75	2 50	1 25	2 00	1 62½	3 00	1 25	1 75	1 00	75	50
		3 87½	3 12½										
5 00	1 33½			4 62½	4 62½	1 62½	55	1 12½	1 00			1 25	1 00
		50	50			2 00				1 25	55	25	25
1 00	1 00					1 75	1 25	1 75	1 50	1 50		50	50
6 00	5 00	2 00	2 00	22 00	12 00	12 50	10 00	12 00	12 00				
		18 00	8 00										
												1 00	1 00
6 50	2 50			2 75	2 75	2 25	1 50	2 50	1 50	1 00			
3 00	50	3 00	2 50			3 00	2 25	3 50	3 00				
		4 00	3 00										
				5 00	4 12½	5 00	3 87½	4 37½	3 50	3 25	1 75	3 50	2 00
5 00	2 75	6 50	4 50	6 00	5 12½	7 25	6 50	7 25	5 00	4 50	2 50	1 00	1 00
7 00	6 00	8 00	7 00										
4 00	2 00			3 75	3 00	3 50	3 00	5 50	3 00	8 00	5 00	6 00	4 12½
		6 00	4 75	150 00	108 00	119 00	76 00	128 00	60 00	125 00	93 00	101 00	56 00
125 00	84 00	160 00	16 00	1 00	1 00			1 62½	1 66½	1 50			

504 MINES AND MINING WEST OF THE ROCKY MOUNTAINS.

Quotations, dividends, and assessments upon stock dealt in at the San Francisco Stock and Exchange Board.

[From the San Francisco Stock Report of January, 1873.]

Name of company.	Bid.	Asked.	Number of assessments.	Number of feet in mine.	Total number of shares.	Total amount per share.	Dividends.	Total amount of assessments.	Amount of dividends disbursed.
CALIFORNIA MINES.									
Alpine			2	1,200	12,000	\$2 50		\$30,000	
Amador				1,850	3,700		33		\$800,250
Bellevue			6	20,000	8,000	2 25		45,000	
Cederberg							1		\$2,000
Calaveras			1	3,200	20,000	50		10,000	
Cottonwood Creek					20,000				
Eureka				1,680	20,000		63		1,754,000
Francis			2		16,000	1 75		28,000	
Gillis			1		24,000	10		2,400	
Golden Eagle			1	2,375	10,000				
Independent Gold Mining Co.			2	1,800	25,000	90		22,500	
Keystone Quartz				10,000			1		5,000
Mount Auburn									
Mount Jefferson			3	1,500	25,000	65		16,750	
Norman									
Oakville Quartz Mining Co.									
Peter Walter			4	1,800	8,000	2 75		22,000	
Saint Patrick Gold Mining Co.			6	18,000	5,000	20 00		100,000	
Tecumseh			1	3,000	30,000	25		7,500	
Yule Gravel			1	400	10,000	25	9	2,500	40,000
WASHOE MINES.									
Arizona and Utah			2	1,900	18,000	1 50		27,000	
Alpha Consolidated	\$0 42		5	300	6,000	22 00		132,000	
American Flat					30,000				
Bacon M. & M. Co				65	4,000				
Baltimore Consolidated			1		54,000	50		27,000	
Best & Belcher	5		8	224	22,400	5 58		124,992	
Belcher	75	\$0 75½	8	1,040	104,000	6 35	8	660,400	2,591,120
Bowers									
Bullion			45	2,500	25,000	75 08		1,802,000	
Buckeye			6		16,000	6 75		108,000	
Caledonia	23½	24	3	5,000	20,000	9 00		180,000	
Central				150	10,800				
Central No. 2				100	20,000				
Chollar-Potosi	51½	52	3	2,800	28,000	16 50	39	462,000	3,080,000
Confidence	4	9	9	130	24,960	8 75	6	218,300	78,000
Consolidated Virginia	48½	50	12	1,160	23,600	11 84		279,600	
Consolidated Gold Hill Quartz			34.4	20,000					
Cook & Geyer			1	1,600	24,000	50		12,000	
Crown Point	91	92	21	600	100,000	6 28	25	623,370	3,198,000
Crown Point Ravine									
Daney	3		4	2,000	24,000	4 00	2	96,000	56,000
Dardanelles				1,200	24,000				
Eclipse	9			70	25,000				
Empire	6½	6½	10	75	50,000	3 85	21	192,500	713,500
Exchequer	13½		9	400	8,000	19 50		156,000	
Flowery			1	3,600	30,000				
Globe			1		20,000			20,000	
Gould & Curry	15½		15	1,200	4,800	217 00	36	1,041,600	3,826,800
Hale & Norcross	85		38	400	16,000	60 63	36	970,000	1,598,000
Imperial	7½	8	14	184	100,000	6 70	30	670,000	1,067,500
Insurance	3			2,000	30,000				
Jacob Little	4½								
Julia	4		12	2,000	30,000	8 37		161,200	
Justice	8		2		21,000	3 00		63,000	
Kentuck	9½	10	7	95	2,000	65 00	32	733,000	1,252,000
Knickerbocker	4½		4	1,200	24,000	3 00		72,000	
Lady Bryan								110,000	
McMeans				3,600	36,000				
New York Consolidated	1½		2	3,600	3,600	75		27,000	
Occidental	1½	2	5	800	10,000	16 50	1	165,000	20,000
Ophir	42	43	23	1,400	16,800	85 09	22	1,429,600	1,394,400
Overman	57½		23	1,200	12,800	78 61		1,006,288	
Phil. Sheridan				1,200	24,000				
Pictou			1	2,000	30,000				
Rock Island		½			24,000	12½		3,750	
Savage	62	62½	7	800	16,000	49 25	52	828,008	4,160,000
Segregated Belcher	62	62	14	160	6,400	33 25		212,800	
Senator	1½		6		24,000	75		12,000	

Quotations, dividends, and assessments upon stock, &c.—Continued.

Name of company.	Bid.	Asked.	Number of assessments.	Number of feet in mine.	Total number of shares.	Total amount per share.	Dividends.	Total amount of assessments.	Amount of dividends disbursed.
WASHOE MINES—Cont'd.									
Sierra Nevada.....	\$0 13	\$0 13½	36	.....	20,000	.....	11	\$500,000	\$102,500
Segregated Caledonia.....	.....	.....	.....	.....	10,000	.....	.....	.....	.....
South Overman.....	.....	.....	.....	.....	24,000	.....	.....	.....	.....
Sutro.....	.....	.....	.....	.....	24,000	.....	.....	.....	.....
Silver Hill.....	5½	.....	.....	.....	54,000	.....	.....	.....	.....
Succor M. & M. Co.....	3¾	.....	4	7,600	22,800	\$5 50	2	125,400	22,800
Trench.....	.....	.....	.....	20	5,000	.....	.....	.....	.....
Tyler.....	.....	.....	.....	2,200	33,000	.....	.....	.....	.....
Union Consolidated.....	.....	.....	1	803	20,000	50	.....	10,000	.....
Utah.....	.....	.....	1	.....	20,000	1 00	.....	20,000	.....
Woodville.....	4¾	.....	.....	1,400	28,000	.....	.....	.....	.....
Yellow Jacket.....	64½	65	14	1,200	24,000	63 25	25	1,518,000	2,184,000
WINNEMUCCA.									
Starlight.....	.....	.....	.....	6,900	25,000	.....	.....	.....	.....
PHILADELPHIA.									
Belmont.....	5	5½	.....	.....	.....	.....	.....	.....	.....
BELMONT.									
Murphy.....	.....	.....	.....	2,000	60,000	.....	.....	.....	.....
WHITE PINE.									
General Lee.....	.....	.....	5	1,000	20,000	50	.....	10,000	.....
Mammoth.....	.....	.....	11	1,800	36,000	1 95	.....	70,200	.....
Noonday.....	.....	.....	11	1,000	20,000	2 65	.....	53,000	.....
Original Hidden Treasure.....	6	.....	8	.....	21,333	12 50	1	266,662	31,999
Silver Wave.....	.....	.....	8	1,600	20,000	7 60	.....	152,000	.....
Ward Beecher.....	.....	.....	.....	.....	24,000	.....	.....	.....	.....
IDAHO MINES.									
Empire.....	.....	.....	1	.....	25,000	50	.....	25,000	.....
Golden Chariot.....	7½	7¾	6	750	10,000	35 90	9	155,000	350,000
Ida Ellmore.....	.....	.....	7	.....	10,000	21 00	6	210,000	60,000
Mahogany.....	.....	.....	7	720	10,000	3 50	.....	104,000	15,000
Minnesota.....	1	.....	2	1,070	20,000	2 00	.....	40,000	.....
North Oro Fino.....	.....	.....	8	600	10,000	50	.....	5,000	.....
South Chariot.....	1½	.....	3	660	20,000	2 50	.....	50,000	.....
Virtue.....	.....	.....	2	2,600	20,000	2 50	.....	50,000	.....
War Eagle.....	.....	.....	1	1,000	10,000	2 00	.....	20,000	.....
COPE DISTRICT.									
Excelsior.....	.....	.....	.....	.....	12,000	.....	.....	.....	.....
ELY DISTRICT.									
Arkansas.....	.....	.....	2	300	30,000	50	.....	22,500	.....
Amelia.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
American Flag.....	8	8½	1	.....	30,000	2 00	.....	60,000	.....
Alps.....	3½	3¾	2	800	30,000	1 75	.....	37,500	.....
Bowery.....	1	.....	2	.....	30,000	1 75	.....	52,500	.....
Chapman.....	.....	.....	1	.....	30,000	.....	.....	15,000	.....
Chief of the Hill.....	3¾	4	.....	.....	30,000	.....	.....	.....	.....
Condor.....	.....	.....	1	.....	25,000	1 00	.....	25,000	.....
Ely Consolidated.....	.....	.....	.....	.....	.....	50	.....	16,000	.....
Pioche West Extension.....	.....	.....	2	.....	35,000	60	.....	21,000	.....
Harper.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huhn & Hunt.....	3½	3¾	3	3,600	30,000	1 75	.....	52,500	.....
Ingomar.....	1	1½	3	1,000	40,000	50	.....	.....	.....
Ivanhoe.....	.....	.....	1	.....	30,000	50	.....	15,000	.....
Jolly Traveler.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Kentucky.....	.....	.....	1	1,000	30,000	50	.....	15,000	.....
Lehigh.....	.....	.....	.....	1,000	30,000	.....	.....	.....	.....
Lillian Hall.....	.....	.....	1	1,000	15,000	50	.....	.....	.....
Louise.....	.....	.....	3	2,400	30,000	63	.....	18,995	.....
Meadow Valley.....	17½	17¾	7	.....	60,000	3 50	15	210,000	1,080,000
Marion.....	.....	.....	.....	.....	30,000	.....	.....	.....	.....
Meadow Valley East.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Quotations, dividends, and assessments, upon stocks, &c.—Continued.

Name of company.	Bid.	Asked.	Number of assessments.	Number of feet in mine.	Total number of shares.	Total amount per share.	Dividends.	Total amount of assessments.	Amount of dividends disbursed.
Mocking-Bird.....				1,200	30,000				
Newark.....			2	800	32,000	\$1 25		\$40,000	
Orient.....				1,000	20,000				
Page & Panaca.....			2	2,400	40,000	1 00		40,000	
Peavine.....			2	1,000	30,000	50		15,000	
Pioche.....	\$0 11½	\$0 11½	1	1,000	20,000	1 50	3	30,000	\$60,000
Raymond & Ely.....	85	85½		5,000	30,000		20		2,685,000
Silver Peak.....					30,000				
Stanford.....									
Sterling.....			1		30,000	50		15,000	
Spring Mount.....					30,000				
Spring Mountain Tunnel.....			3		20,000	75		15,000	
Washington & Creole.....	2½	2½	5	200	30,000	2 75		82,500	
EUREKA DISTRICT.									
Adams Hill.....	½		2		50,000	50		25,000	
Eureka Consolidated.....	11½	11½	3		50,000		4		275,000
Jackson.....			3		50,000	75		37,500	
Phenix.....	1	1½	7		50,000	4 12		212,500	
Star Consolidated.....			2	18,000	50,000	50		25,000	
ESMERALDA.									
Juniata Consolidated.....				5,000	50,000				
UTAH.									
Deseret Consolidated.....			1	2,400	30,000	20		6,000	
Wellington.....			1		50,000				

ERRATA.

During the publication of this report the Commissioner was, for the greater part of the time, at too great a distance from Washington to read the proofs. The care and accuracy of foremen and proof-readers, and of Capt. C. W. Raymond, who revised the galleys and pages, have prevented the occurrence of serious errors. In some cases, however, proper names with which the revisers were unfamiliar have been printed erroneously. Thus, on page 1, Mr. Deetken, of Grass Valley, Cal., appears as "Dutken;" on page 153, Mr. Van Lennep, of Unionville, Nev., will find difficulty in recognizing himself as "Van Jamep;" and on page 155 Mr. Negus, of Star City, Nev., suffers a change into "Nequs." These correspondents, and any others who may be annoyed by such errors of the types, are begged to excuse the offense, in consideration of the difficulties of the case. It is really impossible for a printer in any doubtful case to know how a gentleman spells his name, unless he knows the gentleman. The names of mines, which are frequently whimsical in origin and in orthography, present still greater embarrassments. Less excusable is the transformation, on page 162, of "nut-pine" into "not pine."

R. W. R.

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